Joseph Payne
Æt 65

LECTURES

ON THE

SCIENCE AND ART OF EDUCATION,

WITH OTHER LECTURES AND ESSAYS.

BY THE LATE

JOSEPH PAYNE,

THE FIRST PROFESSOR OF THE SCIENCE AND ART OF EDUCATION IN THE COLLEGE OF PRECEPTORS,
LONDON.

EDITED BY HIS SON,

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WITH AN INTRODUCTION BY THE REV. R. H. QUICK, M.A., TRIN. COLL.,
CAMB., AUTHOR OF "ESSAYS ON EDUCATIONAL REFORMERS."

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PREFACE.

THE lectures and pamphlets included in this volume relate chiefly to the Theory of Science of Education, and form the greater part of Mr. Payne's actually published papers on educational subjects. Besides these, he published lectures on Fröbel, Jacotot, and Pestalozzi, which are omitted from this collection. They will form, with some unpublished lectures, a volume on the History of Education, which may, it is hoped, if sufficient encouragement be met with, follow this.

It is thought that the papers here collected have sufficient unity and completeness to give an adequate idea of Mr. Payne's principles as a teacher. If account be taken of the dates at which they were severally written, it will be seen that they exhibit, with considerable diversity of illustration and some slight variance in points of detail, the persistence of certain dominant principles, the advocacy and enforcement of which was Mr. Payne's chief object in his contributions to the cause of education. Nearly all of those lectures were composed during the last few years of the author's life; but it has been thought that some interest would attach to the re-publication of Mr. Payne's earliest educational essay, "The Exposition of Jacotot's Method," which was indeed his earliest published work on any subject. This essay, written when the author was only 23 years of age, shows how early he had adopted and made his own those principles which he advocated in later life.

A word of explanation may be desirable with respect to two short documents, not previously published, included in this volume. One, the paper entitled "Principles of the Science of Education" (p. 95), was printed for the use of students attending the Lectures on Education delivered by Mr. Payne as Professor at the College of Preceptors. Its composition was the result of much thought and pains, and it may be taken to present, in an aphoristic form, the writer's most mature conception of the educational problem, viewed in the light of natural development. The other, the "Proposal for Endowing a Professorship of Education" (p. 329), was circulated, not by the author, but by the Council of the College of Preceptors. The scheme, at that time much less familiar to the public ear than it has since become, was one in which Mr. Payne always took a deep interest—an interest which he showed not only by the self-denying earnestness with which he performed the duties of a Professor, but by the bequest of a sum of money to the Endowment Fund, and of a valuable library of educational books, which he had been for some years collecting, to the College of Preceptors.

The Editor has to thank the Council of the College of Preceptors for giving permission to reprint some of the lectures in this volume; and Messrs. Kegan Paul and Co., for facilitating the re-publication of the Preface and Supplement to Miss Youmans's work on Botany.

Last, and above all, thanks are due to the Rev. R. H. Quick, not only for the introduction which he has kindly written, but also for valuable aid and advice in the selection and editing of the volume.

The portrait prefixed to this volume is etched by Mr. W. Sherborn, after a photograph by Messrs. Sawyer and Bird.

J. F. PAYNE.

78, Wimpole Street, London,
June 1st, 1880.

The second edition is a reprint of the first.

J. F. P.

June 1st, 1883.

PRESENTED BY
ABANI NATH MUKHARJI
OF UTTARPARA

INTRODUCTION,

BY THE REV. R. H. QUICK.

A FEW words of introduction seem necessary to tell the general reader what it concerns him to know about the author of this volume, and his practical acquaintance with education.

At an early age Mr. Payne became an assistant in a London school; and, as he himself maintained, he would have fallen into the ordinary groove of routine teaching had he not accidentally become acquainted with the principles of the French reformer Jacotot, and been fired with the enthusiasm which Jacotot succeeded in kindling far and wide both in his own country and in Belgium. In England Mr. Payne was the first (in importance, if not in time) of Jacotot's disciples; and finding that the new principles entirely changed his notion of the teacher's office, and turned routine into a course of never-ending experiment and discovery, he forthwith set about preaching the new educational evangel. Though a very young man and with small resources, he published an account of Jacotot's system (1830), and gave public lectures to arouse teachers to a sense of its importance. The system interested a lady, who induced Mr. Payne to undertake the instruction of her own children: and this family became the nucleus of a large school under Mr. Payne's management at Denmark Hill. Some years afterwards, Mr. Payne established himself at the Mansion House, Letherhead, where he was still very successful as a schoolmaster, and where he acquired the means of retiring, after thirty years' work, from the profession. In his school-keeping, and in all his undertakings, even his studies, Mr. Payne was greatly assisted by his wife, a lady who had herself been engaged in education, and who entered into his pursuits with the sympathy of the intellect as well as of the heart, till she was called away, only a few months before her husband. Believing as I do that Mr. Payne's labours have had and will have a great influence on education in this country, I feel bound to bear this testimony to her by whom he was so greatly assisted.

We have seen that Mr. Payne became early in life an enthusiastic theorist. We most of us have our enthusiasms when we are young, and teachers like other people, at first expect to do great things, and make great advances on the practice of their predecessors. But as they grow older the enthusiasms die out. All sorts of concessions to use and wont are forced upon them; and by degrees they find there is much to be said for the usual methods. These methods are, for the master at all events, the easiest; and they have this great advantage, that they lead to the expected results. Changes might lead to unexpected results, and these would not find favour with parents. If we do well what other people are doing, and doing in some cases very badly, we shall please everybody; and why not be satisfied with that which satisfies our employers? In this way we find excuses for our failing energy, and by the time we have experience enough to judge what reforms are possible, we have settled down into indolent contentment with things as they are. To this law of the decay of enthusiasms Mr. Payne's career shows us a striking exception. In early life an interest in principles had changed his occupation from a dull routine to an absorbing intellectual pursuit, and as he went on he found that his study of theory instead of making him "unpractical" gave him great practical advantages. His pupils did not fail in ordinary requirements; and their memory, even for Latin Grammar, was developed without any assistance from the cane. When I first became acquainted with Mr. Payne, he had retired from his school, and I do not know how far he succeeded in carrying out his principles. That they had constant influence over him, no one who knew him would for an instant doubt; but probably, like all high-minded men, he fell far short of his own ideal. But the more he taught himself and the more he had to direct other teachers, the stronger grew his conviction that education should be studied scientifically, that principles should direct practice, and further, that the main cause of weakness in our school system lay in our teachers' ignorance of the nature of their calling, and of the main truths about it already established. The consequence was that when after many years of labour he found himself able to spend his remaining days as he chose, he set to work with an enthusiasm and energy and self-devotion rarely found even in young men, to arouse teachers to a sense of their deficiencies, and to be a pioneer in the needed science of education. It was, I believe, mainly owing to his influence, and to that of his friend Mr. C. H. Lake, that the College of Preceptors instituted an examination for teachers, the first held in this country. In 1872, the College took another important step, and appointed the first English Professor of the Science and Art of Education. The Professor appointed was Mr. Payne, and no man could have been found with higher qualifications. He had always been a diligent student, and had a much wider culture than is usually found in schoolmasters, or indeed in any class of hard-worked men, and his habits of reading and writing now gave him great advantages. But these would have been of little avail had he not possessed the main requisite for the professorship as few indeed possessed it, viz., a profound belief in the present value and future possibilities of the Science of Education. No work could have been more congenial to him than endeavouring to awaken in young teachers that spirit of inquiry into principles, which he had found the salt of his own life in the schoolroom. And short as his tenure of the Professorship unhappily proved, he succeeded in his endeavour, and left behind him students who have learnt from him to make their practice as teachers more beneficial to others and infinitely more pleasurable to themselves, by investigating the theory which not only explains right practice, but also points out the way to it.

That interest in education as a science and an art which was awakened by the delivery of Mr. Payne's lectures, will one day, I trust, be more widely spread by their publication. The papers in this volume have already appeared at different times, and they are now for the first time collected. But there are numerous lectures that still remain in MS.

Mr. Payne always spoke of Jacotot as "his master," and in one of the paradoxes of Jacotot is contained the principle which takes the leading place in Mr. Payne's teaching. Jacotot exposed himself to the jeers of schoolmasters by asserting that a teacher who understood his business could "teach what he did not know." By *teacher* is usually understood one who communicates knowledge. This meaning of the word, however, was unsatisfactory to Jacotot and to his English disciple. What is knowledge? Knowledge is the abiding result of some action of the mind. Whoever causes the mind of pupils to take the necessary action *teaches* the pupils, and this is the only kind of teaching which Mr. Payne would hear of. Thus we see that Jacotot's paradox points to a new conception of the teacher's function. The teacher is not one who "tells," but one who sets the learner's mind to work, directs it and regulates its rate of advance. In order to "tell," one needs nothing beyond a form of words which the pupils may reproduce with or without comprehension. But to "teach," in Payne's sense of the word, a vast deal more was required, an insight into the working of the pupil's mind, a power of calling its activities into play, and of directing them to the needful exercise, a perception of results, and a knowledge how to render those results permanent. Such was Mr. Payne's notion of the teacher's office, and this notion lies at the root of all that he said and wrote about instruction. It would be useless to attempt to decide how far the conception was original with him. "Everything reasonable has been thought already," says Goethe. Mr. Payne, as we have seen, was always eager to declare his obligations to Jacotot. The same notion of the teacher is found in the utterances of other men, especially of Pestalozzi and Fröbel. But when such a conception becomes part and parcel of a mind like Mr. Payne's, it forthwith becomes a fresh force, and its influence spreads to others.

To elevate the teacher's conception of his calling was the task to which Mr. Payne devoted the latter years of his life; and those who knew him best, desire to see his influence extended by this and other publications of his writings, that he may still be a worker in the cause which he had at heart.

R. H. QUICK.

January, 1880.

MR. JOSEPH PAYNE.

The subjoined Obituary Notice appeared shortly after Mr. Payne's death, in the *Educational Times* for June 1st, 1876.

It would be difficult to over-estimate the loss which the cause of educational progress and reform has sustained by the recent death of Mr. Joseph Payne. At the present juncture, when so great an impetus has been given to popular education, and such rapid strides are being taken, not always with the clearest light, or in the wisest direction, and when the guidance and influence of men of wide experience, careful thought, and untiring devotion, is more than ever necessary, few could be named whose place it would be more difficult to supply.

Those who had the privilege of knowing Mr. Payne are aware that, both as a theorist and as a practical teacher, he had made it the business of his life to expose the futility of the unintelligent routine with which educators have too commonly contented themselves, and to rouse teachers to replace it by methods which would call the expanding faculties of the young scholar into healthful activity, which would promote and regulate their development by well-considered and sympathetic guidance, and would direct their action to the best and wisest ends. In short, he strove to make education a reality instead of a pretence. With this view he constantly insisted on the too often forgotten truth, that the only teaching that is worthy of the name is that which enables the learner to teach himself, that which awakens in him the desire for knowledge, and guides him by the surest and readiest methods to its attainment. Such teaching proceeds upon intelligent and scientific principles, and demands of the teacher something different from the hum-drum giving of routine lessons. As the obvious corollary of this, Mr. Payne urged upon teachers the necessity of mastering the true principles that should guide them in the exercise of their profession, and of rousing themselves to the perception of the truth that the teacher *must learn how to teach;* that he must not only know thoroughly and fundamentally *that* *which* he teaches, but must study well the laws which govern the exercise and development of the faculties of *those whom* he teaches; that he must know both the lesson and the scholar, and the means by which the two may be brought into fruitful contact. These aims Mr. Payne pursued throughout his life, unobtrusively indeed, yet with single-minded enthusiasm, and unswerving tenacity of purpose.

Mr. Payne was born at Bury St. Edmund's on the 2nd of March, 1808. His early education was very incomplete, and it was not till he was about fourteen years old that, at a school kept by a Mr. Freeman, he came under the instruction of a really competent teacher. This advantage, however, he did not enjoy very long. At a comparatively early age he was under the necessity of getting his own living, which he did partly by teaching, partly by writing for the press. His life at this period was laborious, and not altogether free from privations. He found time, however, for diligent study, and numerous extract and common-place books testify to the wide range of his reading in the ancient classics and in English literature.

When he was about twenty years of age he become a private tutor in the family of Mr. David Fletcher, of Camberwell. His exceptional aptitude for teaching, and his energetic devotion to study attracted the appreciation and sympathy of the mother of his young pupils. The children of one or two neighbours were admitted to share the benefits of his instruction, and thus a small preparatory school sprang up. Under his zealous and able direction it increased in numbers and consideration, till it expanded into the important school known as "Denmark Hill Grammar School," carried on in a fine old mansion (recently demolished) on Denmark Hill. Here, in partnership with Mr. Fletcher, he continued his labours for some years.

In 1837 Mr. Payne married Miss Dyer, a lady who was at the head of a girls' school of high repute, which she continued to carry on for some time. In her he had the happiness of obtaining, as the partner of his life, a lady of great energy of character, of tact and method in the conduct of affairs, and admirably suited to sympathise with him in the aims and ambitions of his life.

Mr. Payne's connection with the school at Camberwell continued till the year 1845, when he established himself independently at the Mansion House, Lethorhead. Here he laboured with great energy and success for about eighteen years, his school taking rank as one of the very first private schools in this country.

In 1863, having acquired a modest competence, he withdrew from the active cares of his profession. None the less, however, did he continue to devote himself strenuously to the cause of educational progress. He took a lively and active interest in several of the most important movements having this for their purpose, such (for example) as the "Women's Education Union," and the "Public Girls' School Company," the improvement of women's education having long been one of his most cherished objects. By lectures, and through the press, and by his active and energetic participation in the operations carried on by the College of Preceptors, he still zealously pursued the great object of his life—the advancement of education by the improvement of its methods, and the elevation of the character and status of the teacher. The Kindergarten system of Fröbel was one in which he took a keen interest. He studied profoundly the methods and systems of all who have obtained celebrity as educators, and Pestalozzi and Jacotot had in him a warm admirer and an able expositor. When a Professorship of the Science and Art of Education (the first of its kind) was established by the College of Preceptors, he was unanimously elected to occupy that Chair.

Throughout his life Mr. Payne was a hard student. Till but a few months before his death, he was wont to continue his work into the small hours of the morning. He was especially interested in the history of the development of the English language, and the characteristics of the different dialects, and more particularly in the history of the Norman-French element. This led him to a rather extensive study of the dialects of French, and the history of the French language generally. A paper of great value by him on these subjects appears in the "Transactions of the Philological Society," of which he was one of the most distinguished and active members.

Mr. Payne's life had been too laboriously occupied to leave time for the composition of any large literary works; but his little volume of "Select Poetry for Children" is one of the very best of its class, and his "Studies in English Prose," and "Studies in English Poetry," have met with a wide appreciation. Among various lectures and pamphlets published by him, may be mentioned:—"Three Lectures on the Science and Art of Education," delivered at the College of Preceptors in 1871. "The True Foundation of Science Teaching," a lecture delivered at the College of Preceptors in 1872. "The Importance of the Training of the Teacher." "The Science and Art of Education," an introductory lecture delivered at the College of Preceptors. "Pestalozzi," a lecture delivered at the College of Preceptors in 1875. "Fröbel and the Kindergarten System," a lecture delivered at the College of Preceptors. "The Curriculum of Modern Education."

The death of his wife, which occurred in the autumn of last year, probably aggravated the symptoms of a malady of some standing, which terminated, on April 30th, 1876, a life of singular purity and nobleness of aim, of strenuous and unintermitting industry, and of unselfish devotion to high and worthy ends.

LIST OF MR. PAYNE'S CHIEF PUBLISHED WORKS, PAMPHLETS AND PAPERS.

1. Principles and Practice of Jacotot's System of Education, 1830.
2. Epitome Historiæ Sacræ. A Latin reading-book on Jacotot's System, 1830.
3. Select Poetry for Children, First Edition, 1839 (?)
4. Studies in English Poetry, First Edition, 1845.
5. Studies in English Prose, First Edition, 1868.
6. The Curriculum of Modern Education, 1866.
7. Three Lectures on the Science and Art of Education, delivered at the College of Preceptors in 1871.
8. The Training and Equipment of the Teacher for his Profession. College of Preceptors, April 14th, 1869.
9. Theories of Teaching with their corresponding practice. Proceedings of Social Science Association, 1868–69.
10. On the Past, Present, and Future of the College of Preceptors. "Educational Times," July, 1868.
11. On the Importance and Necessity of improving our ordinary methods of School Instruction. Proceedings of Social Science Association, 1871–1872.
12. Preface and Supplement to English Edition of Miss Youmans' "Essay on the Culture of the Observing Powers of Children," 1872.
13. The Importance of the Training of the Teacher, 1873.
14. The true Foundation of Science Teaching, 1873.
15. The Science and Art of Education; an introductory lecture, 1874.
16. Pestalozzi; a lecture delivered at the College of Preceptors, 1875.
17. Fröbel and the Kindergarten System. Third Edition, 1876.
18. Jacotot: his Life and System of Universal Instruction; a lecture delivered at the College of Preceptors, 1867.

19. Dr. Arnold as an Educator; a lecture delivered at the College of Preceptors, 1865.
20. Education in the United States. "British Quarterly Review," 1868.
21. The Higher Education of the United States. "British Quarterly Review," 1870.
22. Eton. "British Quarterly Review," 1867.
23. The Norman Element in the Spoken and Written English of the 12th, 13th, and 14th Centuries. "Proceedings of the Philological Society."
24. A Visit to German Schools, in the autumn of 1874. Published after the author's death, 1876.

THE

SCIENCE AND ART OF EDUCATION.

NOTE.

The three following Lectures formed part of a volume, published in 1872, with this title—

Lectures on Education, delivered before the members of the College of Preceptors in the year 1871; *and published by order of the Council.* London, printed for the College of Preceptors, by C. F. Hodgson and Son, Gough Square, Fleet Street.

Their object is best explained in the prefatory notice prefixed to the volume, here reprinted.

"Among the special objects contemplated by the establishment of the College " of Preceptors in its general purpose "of promoting sound learning and advanc- " ing the interests of education," that of "instituting lectureships on any subject " connected with the theory and practice of Education" holds a prominent place. " In order to carry out this intention, the Council have recently instituted lecture- " ships on education; and the present volume, containing the lectures delivered " before the Members during the year 1871, is the result of their arrangements. " It will be followed by others in due course.

"It is only necessary to add, that while allowing the lecturers full liberty for " the expression of individual opinions on various points of the theory of educa- " tion, the Council do not hold themselves responsible for such opinions."

College of Preceptors,
42, Queen Square, London, W.C.
April, 1872.

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INTRODUCTION, OBITUARY NOTICE,

AND

LIST OF MR. PAYNE'S PUBLISHED WORKS.

LECTURES ON EDUCATION.

LECTURE I.*

THE THEORY OR SCIENCE OF EDUCATION.

It is proposed, in this course of three Lectures, to treat of, 1st, The Theory or Science of Education; 2nd, The Practice or Art of Education; 3rd, Educational Methods, or special applications of the Science and Art.

The Science of Education is sometimes called Pedagogy or Paideutics, and the Art of Education, Didactics. There seems, however, no need for these technical terms. The expressions Science and Art of Education are explicit, and sufficiently answers the purpose.

The Theory or Science, as distinguished from the Practice or Art, embraces an enquiry into the principles on which the Practice or Art depends, and which give reasons for the efficiency or inefficiency of that practice. I do not profess in this Lecture to construct the Science of Education—that still waits for its development. As, however, its ultimate evolution depends very much on a general recognition of its value and importance, I propose to indicate a few of its principles, as well as some of the sources from which they may be derived; and further, to show the need for their application to the present condition of the art.

In the progress of knowledge, practice ever precedes theory. We do, before we enquire why we do. Thus the practice of language goes before the investigation into its laws, and the Art before the Science of Music. It is the same with Education. The practice has long existed; but the theory has, as yet, been only partially recognised. As, however, theory re-acts on practice, and improves it, we may hope to see the same result in Education, when it shall be scientifically investigated.

As the terms Education and Instruction will frequently occur in these Lectures, it may be convenient at the outset to enquire into their exact meaning.

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* Delivered at the House of the Society of Arts, on 12th July, 1871; Professor Huxley, LL.D., in the Chair.

The verb *educare*, from which we get our word *educate*, differs from its primitive *educere* in this respect, that while the latter means to draw forth a single act, the former, as a sort of frequentative verb, signifies to draw forth frequently, repeatedly, persistently, and therefore strongly and permanently; and in a secondary sense to draw forth faculties, to train or educate them. An educator is therefore a trainer, whose function it is to draw forth persistently, habitually, and permanently, the powers of a child, and education is the process which he employs for this purpose.

Then as to Instruction. The Latin verb *instruere*, from which we derive *instruct*, means to place materials together, not at random, but for a purpose—to pile or heap them one upon another in an orderly manner, as parts of a preconceived whole. Instruction, then, is the orderly placing of knowledge in the mind, with a definite object. The mere aggregation, by a teacher, in the minds of his pupils, of incoherent ideas, gained by desultory and unconnected mental acts, is no more *instruction* than heaping bricks and stones together is building a house. The true instructor is never contented with the mere collection of materials, however valuable in themselves, but continually seeks to make them subservient to the end he has in view. He is an educational Amphion, under whose influence the bricks and stones move together to the place where they are wanted, and grow into the form of a harmonious fabric.

Instruction, thus viewed, is not, as some conceive of it, the antithesis of Education, nor generically distinct from it. Every educator is an instructor; for education attains its ends through instruction; but, as will be shown, the instructor who is not also consciously an educator, fails to accomplish the highest aims of his science. The instruction which ends in itself is not complete education.

But we will now attempt to give a definition of Education.

Education, in its widest sense, is a general expression that comprehends all the influences which operate on the human being, stimulating his faculties to action, forming his habits, moulding his character, and making him what he is.* Though so powerfully affected by these influences, he may be entirely unconscious of them. They are to him as "the wind which bloweth where it listeth; but he knows not whence it cometh nor whither it goeth." They are not, however, less real on this account. The circumstances by which he is surrounded—the climate, the natural scenery, the air he breathes, the food he eats, the moral tone of the family life, that of the community—all have a share in converting the raw material of human nature, either into healthy, intelligent, moral and religious man; or, on the contrary, in converting it into an embodiment of weakness, stupidity, wickedness, and misery. Thus external influences, automatically acting upon a neutral nature, produce, each after its kind, the most opposite results. In this sense the poor little gamin of our streets, who defiles the air with his blasphemies, whose thoughts are of the dirt, dirty, who picks our pockets with a clear conscience, has been duly *educated* by the impure atmosphere, the squalid misery, the sad examples of act and speech presented to him in his daily life—to be the outcast that he is. Such instances show the wondrous power of the education of circumstances.

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* Whatever," says Mr. J. S. Mill, "helps to shape the human being, to make the individual what he is, or hinder him from being what he is not, is part of his education."—*Inaugural Address delivered at St. Andrew's.*

It is a noticeable characteristic of this kind of education, that its pupils rarely evince of their own accord any desire for improvement, and are in this respect scarcely distinguishable from barbarians. The savages of our race remain savages, not because they have not the same original faculties as ourselves—faculties generally capable of improvement—but because they have no desire for improvement. Nature does indeed furnish her children with elementary lessons. She teaches them the use of the senses, language, and the qualities of matter, but she leaves them to procure advanced knowledge for themselves, while she implants in their minds neither motive nor desire for its acquisition. The differentia of the savage is, that he has rarely any wish for self-elevation. It is sad to think how many savages of this kind we have still amongst ourselves!

But education is conscious as well as unconscious. Some cause or other suggests the desire for improvement. The teacher appears in the field, and civilisation begins its career. The civilisation which we contrast with barbarism is simply the result of that action of mind on mind which carries forward the teaching of Nature—in other words, of what we call education. Where there is no specific conscious education, there is no civilisation. Where education is fully appreciated, the result is high civilisation; and generally, as education advances, civilisation advances in proportion, and thus affords a measure of its influence. It follows, then, that all the civilisation that exists is ultimately due to the educator, including of course the educator in religion.

Education, then, as we may now more specifically define it, is the training carried on consciously and continuously by the educator, and its object is to convert desultory and accidental force into organised action, and its ultimate aim is to make the child operated on by it capable of becoming a healthy, intelligent, moral and religious man; or it may be described as a systemisation of all the influences which the Science of Education recognises as capable of being employed by one human being to develop, direct, and maintain vital force in another, with a view to the formation of habits.

This conception of the end of education defines the function of the educator. He has to direct forces already existing to a definite object, and in proportion as his direction is wise and judicious will the object be secured.

He has in the child before him an embodiment of animal, intellectual, and moral forces, the action of which is irregular and fortuitous. These forces he has to develop further, direct, and organise. The child has an animal nature, affected by external influences, and endowed with vital energies, which may be used or abused to his weal or woe. He has also an intellectual nature, capable of indefinite development, which may be employed in the acquisition of knowledge, and gain strength by the very act of acquisition; but which may, on the other hand, through neglect, waste its powers, or by perversion abuse them. He has, moreover, a moral nature capable by cultivation of becoming a means of usefulness and happiness to himself and others, or of becoming by its corruption the fruitful source of misery to himself and the community.

It is the business of the educator, by his action and influence on these forces, to secure their beneficial and avert their injurious manifestation—to convert their undisciplined energy into a fund of organised self-acting power.

In order to do this efficiently, he ought to understand the nature of the phenomena that he has to deal with; and his own training as a teacher ought especially so have this object in view. Without this knowledge, much that he does may be really injurious, and much more of no value.

To speak technically, then, a knowledge of what is going on in his pupils' bodies, minds, and hearts, their subjective process, will regulate the means which he adopts to direct the action of those bodies, minds, and hearts, which is his objective process—the one being a counterpart of the other—and the consideration of what this knowledge consists of, and how it may be best applied, constitutes the Theory or Science of Education.

I am well aware that the mention of the words "Theory of Education," and the assumption that the educator ought to be educated in it, is apt to excite some degree of opposition in the minds of those who claim especially the title of "practical teachers," and who therefore characterise this theory as "a quackery." Now a quack, the dictionary tells us, is "one who practises an art without any knowledge of its principles." There seems, then, to be a curious infelicity of language in calling a subject which embraces principles, which especially insists on principles, a quackery. If education, thus viewed, is a quackery, then the same must be said of medicine, law, and theology: and it would follow that the greatest proficient in the principles of these sciences must be the greatest quack—a remarkable *reductio ad absurdum.* This position, then, will perhaps hardly be maintained.

But there is a second line of defence. The practical teachers say—and, doubtless, say sincerely—"We don't want any Theory of Education; our aim is practical, we want nothing but the practical." We agree with them as to the value, the indispensable value, of the practical, but not as to the assumed antagonism between theory and practice. So far from being in any strict sense opposed, they are identical. Theory is the general, practice the particular, expression of the same facts. The words of the theory interpret the practice; the propositions of the science interpret the silent language of the art. The one represents truth *in posse*, the other *in esse*; the one, as Dr. Whewell well remarks, *involves*, the other *evolves*, principles. So in Education, theory and practice go hand-in-hand; and the practical man who denounces theory is a theorist in fact.* He does not of course drive blindly on, without caring whither he is going; the conception, then, which he forms of his end, is his theory. Nor does he act without considering the means for securing his object. This consideration of the means as suitable or unsuitable for his purpose, is again his theory. In fact the reasons which he would give for his actual practice, to account for it or defend it, constitute, whether he admits it or not, his theory of action. All that we ask is, that this conception of theory, in relation to education, should be extended and reduced to principles.

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* "Theory and practice always act upon each other; one can see from their works what men's opinions are; and from their opinions predict what they will do."—*Göthe.*

Mr. Grove (now the eminent Judge), in an address given at St. Mary's Hospital, forcibly expresses the same opinion:—"If there be one species of cant," he says, "more detestable than another, it is that which eulogises what is called the *practical man* as contradistinguished from the *scientific*. If by practical man is meant one who, having a mind well stored with scientific and general information, has his knowledge chastened and his theoretic temerity subdued, by varied experience, nothing can be better; but if, as is commonly meant by the phrase, a practical man means one whose knowledge is only derived from habit or traditional system, such a man has no resource to meet unusual circumstances; such a man has no plasticity; he kills a man according to rule, and consoles himself, like Molière's doctor, by the reflection that a dead man is only a dead man, but that a deviation from received practice is an injury to the whole profession."

Practical teachers may, however, admit that they have a theory, an empirical theory, of their own which governs their practice, and yet deny that the generalisation of this theory into principles would be of any value to themselves or to the cause of education. They may go further still and deny both that there is or can be any Science of Education. Some do, indeed, deny both these positions. It has already been admitted that the Science of Education is as yet in a rudimentary condition. There is at present no such code of indisputable laws to test and govern educational action as there is in many other sciences. Its principles lie disjointed and unorganised in the sciences of Physiology, Psychology, Ethics, and Logic, and will only be gathered together and codified when we rise to a high conception of its value and importance. Even now, however, they are acknowledged in the discussion of such questions as, the best method of training the natural faculties of children—the order of their development—the subjects proper for the curriculum of instruction—book teaching *versus* oral—the differentia of female education—school discipline—moral training, and a multitude of others which will one day be decided by a reference, not to traditional usage, but to the principles of the Science of Education. The fact, then, that this science is not yet objectively constructed is no argument against our attempting to construct it, and we maintain that the pertinacious adherence to the notion of the all-sufficiency of routine forms the greatest difficulty in the way of securing the object. It is, however, mainly for the sake of the teachers of the next generation, that the importance of a true conception of the value of principles in education is insisted on.

It follows, then, that practical teachers who desire to see practice improved—and surely there is need of improvement—ought to admit that there is the same obligation resting on the educator to study the principles of his art as there is on the physician to study anatomy and therapeutics, and on the civil engineer to study mechanics. The art in each of these cases has a scientific basis, and the practitioner who desires to be successful in it—to be the master and not the slave of routine—must studiously investigate its fundamental principles.

But there is another argument against routine teaching which ought not to be omitted. It is founded on the effect which such teaching produces on the pupil. Those teachers who are themselves the slaves of routine make their pupils slaves also. Without intellectual freedom themselves, they cannot emancipate their pupils. The machine generates machines. They make their pupils mechanically apt and dexterous in processes, and in this way train them to practice; but not appreciating principles themselves, they cannot train them to principles. Yet this latter training, which essentially involves reasoning and thought, ought to be the continual and persistent aim of the educator. He has very imperfectly accomplished the end of his being if he dismisses his pupils as merely mechanical artisans, knowing the *how*, but ignorant of the *why;* expert in processes, but uninformed in principles; instructed, but not truly educated. It is the possession of principles which gives mental life, courage, and power: the courage which is not daunted where routine fails, the power which not only firmly directs the established machinery, but corrects its apparent eccentricities, can repair it when it is deranged, and adjust its forces to new emergencies. Take the case of a routine pupil to whom you propose an arithmetical problem. His first inquiry is, not what are the conditions of the question, and the principles involved in its solution, but what rule he is to work it by.* This is the question of a slave, who can do nothing without orders from his master. Well, you give him the rule. The rule is, in fact, a *résumé* of principles which some scientific man has deduced from concrete facts, and which represents and embodies the net result of various processes of his mind upon them. But what is it to our routine pupil? To him it is merely an order given by a slave driver, and he hears it in the words,—Do this; don't do that; don't ask why; do exactly as I bid you. He reads his rule, his order, does what he is bid, grinds away at his work, and arrives at the end of it as much a slave as ever, and he is a slave because his master has made him one.

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* MM. Demogeot and Montucci, in their Report to the French Government on English Secondary Instruction (Paris, 1867), severely comment on the mechanical spirit in which mathematics are generally taught in our schools through our taking little account of the reason, and making processes rather than principles the end of instruction (p. 129).

Educators, indeed, like other men, come under two large categories, which may be described in the pregnant words of the accomplished author of the "Autocrat of the Breakfast Table." "All economical and practical wisdom," he says, "is an extension or variation of the following arithmetical formula $2+2=4$. Every philosophical proportion has the more general character of the expressions $a + b = c$. We are merely operatives, empirics, and egotists, until we begin to think in letters instead of figures."

Now the mere routine teacher belongs to the former, and the true educator to the latter class, and each will stamp his own image on his pupils.

All that has been said resolves itself, then, into the proposition that a man engaged in a profession, as distinguished from a mere handicraft, ought not only to know *what* he is doing, but *why*; the one constituting his practice, the other his theory. He cannot give a reason for the faith that is in him, unless he examines the grounds of that faith,—unless he examines them *per se*, and traces their connection with each other and with the whole body of truth. The possession of this higher kind of knowledge, the knowledge of principles and laws, is, strictly speaking, his only warrant for the pretension that he is a *professional* man, and not a mere mechanic. Society has not, indeed, hitherto demanded this professional equipment for the educator, nor has the educator himself generally recognised the obligation, aptly stated by Dr. Arnold, that, "in whatever it is our duty to act, those matters also it is our duty to study," and hence the present condition of education in England. Education can never take its proper rank among the learned professions, that proper rank being really the highest of them all, until teachers see that there really are principles of Education, and that it is their duty to study them.

But there is another mode of studying principles besides investigating them *per se*. They may be studied in the practice of those who have mastered them.

It is clear that a man may have carefully investigated the principles of an art, and yet fail in the application of them. This generally arises from his not having fully comprehended them. He has omitted to notice or appreciate something which, if he knew it, would answer his purpose; or from want of early training finds it difficult to deduce facts from principles, practice from theory. In such a case there is an available resource. Others have seen what he has failed to see, have firmly grasped what he has not comprehended, have made the necessary deductions, and embodied them in their own practice. Let the learner, then, in the Science of Education, study that practice, and trace it in the correspondence between the principles which he but partially appreciates, and their pratical application in the methods of those who have thought them out. In other words, let him study the great masters of his art, and learn from them the philosophy which teaches by examples. This study, so far from being inconsistent with the Theory of Education, is, indeed, a necessary part of it. We may all learn something from the successful experience of others. De Quincy (as quoted by Mr. Quick in his valuable "Essays on Educational Reformers") has pointed out that a man who takes up any pursuit, without knowing what advances others have made in it, works at a great disadvantage. He does not apply his strength in the right direction, he troubles himself about small matters and neglects great, he falls into errors that have long since been exploded. To this Mr. Quick pertinently adds,—"I venture to think, therefore, that practical men, in education, as in most other things, may derive benefit from the knowledge of what has been already said and done by the leading men engaged in it both past and present." Notwithstanding the obvious common sense of this observation, it is undeniably true that the great majority of teachers are profoundly ignorant of the sayings and doings of the authorites in Education. Their own empirical methods, their own self-devised principles of instruction, generally form their entire equipment for the profession. I have myself questioned on this subject scores of middle-class teachers, and have not met with so many as half-a-dozen who knew anything more than the names, and often not these, of Quintilian, Ascham, Comenius, Locke, Pestalozzi, Jacotot, Arnold, and Herbert Spencer. What should we say of a physician who was entirely unacquainted with the researches of Hippocrates, Galen, Harvey, Sydenham, the Hunters, and Bright?

In the foregoing remarks I have endeavoured to show that there is, and must be, a Theory of Education underlying the practice, however manifested, and to vindicate the conception of it from the contempt sometimes thoughtlessly thrown upon it by practical teachers.

But it is important now to attempt to ascertain what resources, in the shape of principles, hints, and suggestions, it furnishes to the educator in his three-fold capacity of director of Physical, Mental, and Moral education.

The conception we have formed of the educator in relation to his work requires him to be possessed of a knowledge of the being whom he has to control and guide. "Whatever questions," says Dr. Youmans, of New York, "of the proper subjects to be taught, their relative claims, or the true methods of teaching them, may arise, there is a prior and fundamental enquiry into the nature, capabilities, and requirements of the being to be taught. A knowledge of the being to be trained, as it is the basis of all intelligent culture, must be the first necessity of the teacher "(p. 404).*

Physical Education.

Viewed merely as an animal, this being is a depository of vital forces, which may be excited or depressed, well-directed or misdirected. These forces are resident in a complicated structure of limbs, senses, breathing, digesting and blood-circulating apparatus, &c.; and their healthy manifestation depends much (of course not altogether) upon circumstances under the control of the educator. If he understands the phenomena, he will modify the circumstances for the benefit of the child; if he does not understand them, the child will suffer from his ignorance. The daily experience of the schoolroom sufficiently illustrates this point. Place a large number of children in a small room with the windows shut down, and detain them at their lessons for two or three hours together. Then take note of what you see. The impure air, breathed and rebreathed over and over again, has lost its vitality—has become poisonous. It reacts on the blood, and this again on the brain. The teacher as well as the children all suffer from the same cause. He languidly delivers a lesson to pupils who more languidly receive it. They are no longer able to concentrate their attention. They answer his half-understood questions carelessly and incorrectly. Not appreciating the true state of the case, he treats them as wilfully indifferent, and punishes the offenders, as they feel, unjustly. They retain this impression; the cordial relation subsisting before is rudely disturbed, and his moral influence over them is impaired. We have here a natural series of causes and consequences. The state of the air, a physical cause, acts first on the bodies, then on the minds, and lastly on the hearts of the pupils; the last being, perhaps, the most important consequence of the three. Now in this case both teacher and pupils suffer from neglect of those laws of health which a knowledge of Physiology would have supplied. It is unnecessary to dwell upon the obvious applications of such knowledge to diet, sleep, cleanliness, clothing, &c.

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* "The Culture demanded by Modern Life: a series of addresses and arguments on the claims of scientific education. Edited by Dr. Youmans, New York, 1867." There is also an English edition, published by Macmillan.

Knowledge of this kind has been strangely overlooked in the educator's own education, though so much of his efficiency depends on his acting himself, and causing others to act, on the full recognition of its value. Education has too generally been regarded in its relation to the mind, and the co-operation of the body in the mind's action has been forgotten. Those who listened to the masterly lecture delivered a few years ago at this College by Dr. Youmans, on "The Scientific Study of Human Nature," will remember his eloquent vindication of the claims of the body to that consideration which educators too frequently deny it, and the consequent importance to them of sound physiological knowledge. With singular force of reasoning he showed that the healthiness of the brain, as the organic seat of the mind, is the essential basis of the teacher's operations; that the efficiency of the brain depends in a great degree on the healthy condition of the stomach, lungs, heart and skin; and that this condition is very much affected by the teacher's application of the laws of health as founded on Physiology. His general remarks on education, and especially on physical education, are too valuable to be omitted:—

"The imminent question," he says (p. 406), "is, how may the child and youth be developed healthfully and vigorously, bodily, mentally, and morally? and science alone can answer it by a statement of the laws upon which that development depends. Ignorance of these laws must inevitably involve mismanagement. That there is a large amount of mental perversion and absolute stupidity, as well as bodily disease, produced in school, by measures which operate to the prejudice of the growing brain, is not to be doubted; that dullness, indocility, and viciousness, are frequently aggravated by teachers, incapable of discriminating between their mental and bodily causes, is also undeniable; while that teachers often miserably fail to improve their pupils, and then report the result of their own incompetency as *failures of nature*,—all may have seen, although it is now proved that the lowest imbeciles are not sunk beneath the possibility of elevation."

I give one short quotation from Dr. Andrew Combe, to the same effect. "I cannot," he says, "regard any teacher, or parent, as fully and conscientiously qualified for his duties, unless he has made himself acquainted with the nature and general laws of the animal economy, and with the direct relation in which these stand to the principles of education." Dr. Brigham also advises those who undertake to cultivate and discipline the mind, to acquaint themselves with Human Anatomy and Physiology.

All these authorities agree, then, that educators have a better chance of improving the physical condition of their pupils if they are themselves acquainted with the laws of health; and they insist, moreover, that the health of the body is not only desirable for its own sake, but because, from the interdependence of mind and body, the *mens sana* depends so much on the *corpus sanum*. This truth is strikingly, though paradoxically, expressed by Rousseau, when he says, "The weaker the body is, the more it commands; the stronger it is the better it obeys;" and when he also says, "make your pupil robust and healthy, in order to make him reasonable and wise."

In short, hundreds of writers have written on this subject for the benefit of educators, thousands of whom have never even heard of, much less read, their writings; or, if they have, pursue the even tenour of their way, doing just as they did before, and ignorantly laughing at Hygiene and all the aid she offers them.

Physical education also comprehends the training of special faculties and functions, with a view to improve their condition. The trainer of horses, dogs, singing birds, boxers, boat crews, and cricketers, all make a study, more or less profound, of the material they have to deal with—all except the educator, the trainer of trainers, who generally leaves things to take their chance, or assumes that the object will be sufficiently gained by the exercises of the playground and the gymnastic apparatus. It would be easy to show that this self-education, although most valuable, is insufficient, and ought to be supplemented by the appliances of Physiological Science. This science would suggest, in some cases, remedies for natural defects; in others, suitable training for natural weakness; in others, still graver reasons for checking the injurious tendency, so common amongst children, to over-exertion; and in all these cases would be directly ancillary to the professed object of the educator as a trainer of intellectual and moral forces.

The effect, too, of the condition of the mind on that of the body

—the converse reciprocal action—is an important part of this subject; but there is no time to enter on it.

Intellectual Education.

But let us next consider the relation of the educator to the *intellectual education* of his pupils. However willing he may be to repudiate his responsibility for the training of their bodies, he cannot deny his responsibility for the training of their minds. But here Dr. Youmans' words, already quoted, apply with especial force —"A knowledge of the being to be trained, as it is the basis of intelligent culture, must be the first necessity of the teacher," and few perhaps will venture to argue against those that follow: "Education," he says, "is an art, like locomotion, mining, and bleaching, which may be pursued empirically or rationally—as a blind habit, or under intelligent guidance: and the relations of science to it are precisely the same as to all the other arts—to ascertain their conditions, and give law to their processes. What it has done for navigation, telegraphy, and war, it will also do for culture."

The educator of the mind ought, then, to be acquainted with its phenomena and its natural operations; he ought to know what the mind does when it perceives, remembers, judges, &c., as well as the general laws which govern these processes. He sees these processes in action continually in his pupils, and has thus abundant opportunities of studying them objectively. He is conscious of them, too, in his own intellectual life, and there may study them subjectively; but the investigation, thus limited, is confessedly difficult, and will be much facilitated by his making an independent study of them as embodied in the science of Psychology or Mental Philosophy. This science deals with everything which belongs to the art which he is daily practising, will explain to him some matters which he has found difficult, will open his eyes to others which he has failed to see, will suggest to him the importance of truths which he has hitherto deemed valueless; and, in short, the mastery of it will endow him with a power of which he will constantly feel the influence in his practice. His pupils are continually engaged in observing outward objects, ascertaining their nature by analysis, comparing them together, classifying them, gaining mental conceptions of them, recalling these conceptions by memory, judging of their relations to each other, reasoning on these relations, imagining conceptions, inventing new combinations of them, generalising by induction from particulars, verifying these generalisations by deduction to particulars, tracing effects to causes and causes to effects. Now, every one of these acts forms a part of the daily mental life of the pupils whom the educator is to train. Will not the educator, who understands them as a part of his science, be more competent to direct them to profitable action than one who merely recognises them as a part of his empirical routine? Suppose that the object is to cultivate the power of observation. Now the power of observation may vary in accuracy from the careless glance which leaves scarcely any impression behind it, to the close penetrating scrutiny of the experienced observer, which leaves nothing unseen. Mr. J. S. Mill (Logic i. 408) has pointed out the difference between observers. "One man," he says, "from inattention, or attending only in the wrong place, overlooks half of what he sees; another sets down much more than he sees, confounding it with what he imagines, or with what he infers; another takes note of the *kind* of all the circumstances, but, being inexpert in estimating their *degree*, leaves the quantity of each vague and uncertain; another sees indeed the whole, but makes such awkward division of it into parts, throwing things into one mass which ought to be separated, and separating others which might more conveniently be considered as one, that the result is much the same, sometimes even worse, than if no analysis had been attempted at all. To point out," he proceeds, "what qualities of mind, or modes of mental culture, fit a man for being a good observer, is a question which belongs to *the theory of education*. There are rules of self-culture which render us capable of observing, as there are arts for strengthening the limbs."

But to return to our educator, who, having been educated himself in Mental Science, desires to make his pupils good observers. He recognises the fact that, to make them observe accurately, he must first cultivate the senses concerned in observing; he must train the natural eye to see, that is, to perceive accurately—by no means an instinctive faculty; for this he must cultivate the power of attention; he must lead them to perceive the parts in the whole, the whole in the parts, of the object observed, calling on the analytical faculty for the first operation, the synthetical for the second; he must invite comparison with other like and unlike objects, for the detection of difference in the one case, and of similarity in the other, and so on. It is probable that the teacher entirely ignorant of the science of Psychology, and the educator furnished with its resources, will make their respective pupils equally accurate observers?

It would not be difficult to show that a knowledge of Logic, as "the science of reasoning," or of the formal laws of thought, should also be a part of the equipment of the accomplished educator. The power of reasoning is a natural endowment of his pupils; but the power of correct reasoning, like that of observing, requires training and cultivation. But we cannot dwell on this point.

In futher illustration of the main argument, I beg to refer my hearers to the very ingenious lecture lately delivered at this College by my friend Mr. Lake, on "The Application of Mental Science to Teaching," and especially to teaching Writing, wherein he shows that even that mechanical art may be made a means of real mental training to the pupil. He proves that Muscular Sensibility, Sensation, Thought, Will, as well as the nascent sense of Artistic Taste, are all involved in the subjective process of the pupil; that in accordance with this, the educated educator frames the objective process, through which he develops the pupil's mind, and to some extent his moral character, and thus makes him a practical proficient in his art. Mr. Lake's lecture is probably the first attempt ever made to show the direct practical bearing of physiological and psychological knowledge on the art of teaching, and deserves the thoughtful consideration of all educators. This same Mental Science is also applicable to the teaching of Reading and Arithmetic. Indeed, I am persuaded—and I speak from some experience—that these elementary arts may be so taught as to become, not only "instruction," but true "education," to the child; not merely, as they are generally regarded, "instruments of education," but education itself. Observation, memory, judgment, reasoning, invention, and pleasurable associations with the art of learning, may all be cultivated by a judicious application of the principles of Mental Science. Mulhäuser, and Manly (of the City of London School), have proved this for Writing, Jacotot for Reading, and Pestalozzi for Arithmetic. When this truth is acknowledged it will be felt more generally than it is now, that the most pretentious schemes and curricula of education are, after all, comparatively valueless if they do not secure for the pupil the power of *doing common things well.* This, however, is a theme which would require a lecture by itself for its adequate treatment.

Moral Education.

But the child whom we have considered as the object of the educator's operations has moral as well as physical and intellectual faculties; and the development of these, with the view of forming character, is a transcendently important part of the educator's work. This child has feelings, desires, a will, and a conscience, which are to be developed and guided. Here, too, as in the other cases, Nature has given elementary teaching, and elicited desultory and instinctive action; but her lessons are insufficient, and require to be supplemented by the educator's.

The child, as already said, is a moral being, but his moral principles are crude and inconsistent. Acted on by the impulse of the moment, he follows out the promptings of his will, without any regard to personal or relative consequences; and if the will is naturally strong, even the experience of injurious consequences does not, of itself, restrain him. Self-love induces him to regard everything that he wishes to possess as rightfully his own. He says by his actions, "Creation's heir, the world—the world is mine." He is therefore indifferent to the rights of others, and resents all opposition to his self-seeking. He is also indifferent to the feelings of others, and often tyrannises over those who are weaker than himself. His unbounded curiosity impels him incessantly to gain knowledge. He examines everything that interests him; acquires both ideas and expressions by listening to conversation; breaks his toys to see how they are made; displays also his constructive ability by cutting out boats and paper figures. But he has sympathy as well as curiosity. He makes friends, learns to love them, to yield up his own inclinations to theirs; imitates their sayings and doings, good and bad; adopts their notions, becomes like them. He has also a conscience, which, when awakened, decides, though in an uncertain manner, on the moral quality of his actions; and lastly, he has a will, which is swayed by this self-love, curiosity, sympathy, and conscience.

This is a slight sketch of the moral forces which the educator has to control and direct. Now every teacher is conscious that he can, and does every day, by his personal character, by the economic arrangements of the school, by his general discipline, by special treatment of individual cases, exercise a considerable influence over these moral phenomena; and must confess that the extent of this influence is generally measured by his own knowledge of human nature, and that when he fails it is because he forgets or is ignorant of some elementary principle of that nature. If he allows this, he must allow that a larger acquaintance with the principles on which human beings act,—the motives which influence them,—the objects at which they commonly aim,—the passions, desires, characters, manners, which appear in the world around him and in his own constitution,—would proportionately increase his influence.

But these are the very matters illustrated by the science of Morals, or Moral Philosophy, and the educator will be greatly aided in his work by knowing its leading principles.

For what is the object of moral training? Is it not to give a wise direction to the moral powers,—to encourage virtuous inclinations, sentiments, and passions, and to repress those that are evil,—to cultivate habits of truthfulness, obedience, industry, temperance, prudence, and respect for the rights of others, with a view to the formation of character?

This enumeration of the objects of moral training presents a wide field of action for the educator; yet a single day's experience in any large school will probably supply the occasion for his dealing with every one of them. How important it is, then, that he should be well furnished with resources.

Every earnest educator, moreover, will confess that he has much to learn, especially in morals, from his pupils. To be successful, he must study his own character in theirs, as well as theirs in his own. Coleridge has well put this in these lines:—

> "O'er wayward childhood would'st thou hold firm rule,
> And sun thee in the light of happy faces?
> Love, Hope, and Patience—these must be thy graces;
> And in thine own heart let them first keep school."

A little story from Chaucer illustrates the same point. I give it in his own words:—"A philosopher, upon a tyme, that wolde have bete his disciple for his grete trespas, for which he was gretly amoeved, and brought a yerde to scourge the child; and whan the child saugh the yerde, he sayde to his maister, 'What thenke ye to do?' 'I wolde bete the,' quod the maister, 'for thi correccioun.' 'Forsothe,' quod the child, 'ye oughte first correcte youresilf that han lost al youre pacience for the gilt of a child.' 'Forsothe,' quod the maister, al wepying, 'thou saist soth; have thou the yerde, my deere sone, and correcte me for myn impacience.'" This master was learning, we see, in the school of his own heart, and his pupil was his teacher.

Time does not allow of our entering more in detail into the question of moral training, and showing that the great object of moral, like that of physical and intellectual education, is to develop force, with a view to the pupil's *self-action*. Unless this point is gained—and it cannot be gained by preceptive teaching—little is gained. Our pupil's character is not to be one merely for holiday show, but for the daily duties of life—a character which will not be the sport of every wind of doctrine, but one in which virtue,—moral strength,—is firmly embodied. Such a character can only be formed by making the child himself a co-operator in the process of formation.

If I have not specially referred to religious, as a part of moral, education, it is because no truly religious educator can fail to make it a part of his system of means. As for the case of the teacher whose every-day life shows that he is not influenced himself by the religion which he, as a matter of form, imposes upon his pupils, I have great difficulty in conceiving of him as a teacher of morals at all.

I have now completed the general view I proposed to take of the relation of the educator to his work; and the gist of all that I have said is contained in the simple proposition, that he ought to know his business, if he wishes to accomplish its objects in the best way. The deductions from this proposition are,—that, as his business consists in training physical, mental, and moral forces, he ought to understand the nature of these forces, both in their statical and dynamical condition, at rest and in action, and should therefore study Physiology, Psychology, Ethics, and Logic, which explain and illustrate so many of the phenomena;* that he should, moreover, study them, as embodied in the practice of the great masters of his art. Inspired thus with a noble ideal of his work, he will gradually realise it in his practice, and become an accomplished educator. He will meet with many difficulties in this self-training, but the advantages he gains will more than compensate him. None can know better than himself—none so well—the trials, disappointments, faintings of heart, and defeats that his utmost skill cannot always turn into victories, which he will have to encounter; but then, on the other hand, few can know as he does those moments of wonderful happiness which fall to his lot when he sees his work going on well; when, in the improved health, the increased intellectual and moral power of his pupils, he recognises the result of measures which he has devised, of principles which he has learnt from the school without, from the school within, and from the ripe experience and thought of the fellow-labourers of his craft. At such moments, fraught with the spirit of the great artist, who exclaimed in his enthusiasm, "Ed io anche sono pittore!" he also exclaims, "And I too am an educator!" This enthusiam will be more common when educators entertain a more exalted conception of their profession.

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* The late Mr. Fletcher, Inspector of Schools, thus enforces the same doctrine: —"The intellectual faculties can never be exercised thoroughly but by men of sound logical training, perfect in the art of teaching; hence there exist so few highly-gifted teachers. In fact there are none but men of some genius who are said to have peculiar *tact*, which it is impossible to imitate; but I am anxious to see every part of the fine art of instruction redeemed from hopeless concealment under such a word, and made the subject of rational study and improved training."

That the educator cannot fully realise his conception is no argument against his keeping it constantly in view, to stimulate his zeal and guide his practice. The equation of aims and achievements must, after all, be an indeterminate one; but we approach nearer and nearer to its solution, by a high assumption for the aims. "We strive," as Coleridge says, "to ascend, and we ascend in our striving."

Nothing has been said of the value of Physiology, Psychology, &c., to the educator merely as a man, not as a professional man. But it is easy to see that it must be great. Nor have they been pointed out as subjects of direct instruction for his pupils; yet surely it is important that he should be able to give in his classes elementary lessons on all these subjects, particularly on Physiology. The nomenclature, at least, and the rudiments of Psychology may be advantageously learned by elder pupils, and the elements of Logic should certainly form a part of the instruction of students of Euclid and grammatical analysis.

But beyond the theoretical treatment of the Science of Education, I have a practical object in view. I wish to show that there is a strong presumption that the educator of our day needs education in his art. Individual teachers may deny this for themselves—they generally do—but they freely admit it with regard to their rivals in the next street, or the next town. Generalise this admission, and all we ask for is granted. But there is a test of a different kind which disposes of the question—the test of results. "By their fruits ye shall know them." If the fruit is good, the tree is good. If the large majority of schools are in a satisfactory condition, then the educator is doing his work well; for "as is the master, so is the school"—which means, to speak technically, that the results of a system of education are not as the capabilities of the pupil, nor as the external school machinery, but as the professional preparedness of the educator. If, then, the large majority of schools are unsatisfactory, it is because the teacher is unsatisfactory. And that they are so is proved by every test that can be applied. All the Commissions on Education—whether primary, secondary, or advanced—tell the same tale, pronounce the same verdict of failure; and that verdict would have been more decided had the judges been themselves educators. Dealing with a subject which they know mostly as amateurs, not as experts, they are not competent to estimate the results by a scientific standard; they therefore reckon as good much that is really bad; for the value of a result in education mainly depends on the manner in which it has been gained. Yet even these estimators severally declare that the educational machinery of this country is working immensely under the theoretical estimate of its power. The "scandalously small" results of the Public School education are paralleled or exceeded by those of the Middle-Class and Primary Schools; and in cases of primary schools where this epithet would not apply, we find that the superiority is due to the preliminary training of the teacher.

What, again, is to be said of the evidence furnished by such a statement as the following, which is extracted from the *Athenæum* of March 27, 1869:—"A petition was last week presented to the House of Commons from the Council of Medical Education, stating that the maintenance of a sufficient medical education is very difficult, owing to the defective education given in middle-class schools. A similar complaint was made in a petition from the British Medical Association, numbering 4000 members. In a third petition, proceeding from the University of London, it was stated that during the last ten years 40 per cent. [it has since been more than 50 per cent.] of the candidates at the Matriculation examinations have failed to satisfy the examiners."

Once more, Sir John Lefevre, describing, in 1861, the mental condition of the candidates for the Civil Service who came before him for examination, refers to "the incredible failures in orthography, the miserable writing, the ignorance of arithmetic." "It is comparatively rare," he says, "to find a candidate who can add correctly a moderately long column of figures." Some improvement has taken place, no doubt, during the last ten years under the influence of the examinations of the College of Preceptors, and those of Oxford and Cambridge, but the main difficulty remains much the same.

This, then, is the evidence, or rather a part of the evidence, which attests the unsatisfactory results of our middle-class teaching. But we repeat, "as are the teachers, so are the schools;" and, therefore, without hesitation make the teachers directly responsible for these results. Had they been masters of their art, these results would have been impossible; and they are not masters of their art, because they have not studied its principles, nor been scientifically trained in its practice.

The true remedy has been suggested by many eminent men, not merely by teachers. It consists in teaching the teacher how to teach, in training the trainer, in educating the educator.

Thus, Dr. Gull, after complaining of the insufficient education of youths who are to study medicine, said (Evidence before Schools Enquiry Commission) that "improvement must begin with the teachers. Anyone is allowed to teach. There is no testing of the teacher. I think he should be examined as to his power of teaching and his knowledge." "The subjects (for his preparation) should include the training of the senses, and the intellect, and the teaching of the moral relations of man to himself and his neighbour."

Mr. Robson, in his evidence before the same Commission, said: "We should require certificates of teachers showing that knowledge has been attained, and also some knowledge of Mental Philosophy in connection with the art of Teaching. Every teacher has to act on the human mind, and unless he knows the best methods of so acting, it is quite impossible he can exercise his powers to the best advantage." The evidence of Messrs. Howson, Besant, Goldwin Smith, Best, and others, was to the same effect.

The Assistant Commissioners, Messrs. Bryce, Fearon, and especially Mr. Fitch, make the same complaints of the want of training for the teacher. Mr. Fitch—who has every right to be heard on such a point, for he thoroughly knows the subject, practically as well as theoretically—says in his report on Yorkshire Endowed and Private Schools, "Nothing is more striking than the very general disregard on the part of schoolmasters of the Art and Science of Teaching. Few have had any special preparation in it. Professional training for middle-class schoolmasters does not exist in this country. It is certain that many of them would gladly obtain it, if it were accessible. But at present it is not to be had." And again, "It is a truth very imperfectly recognised by teachers, that the education of a youth depends not only on what he learns, but on how he learns it, and that some power of the mind is being daily improved or injured by the methods which are adopted in teaching him." Mr. Fitch, in another place,* also remarks, "We all know instances of men who understand a subject thoroughly, and who are yet utterly incapable of teaching it. We have all seen that waste of power and loss of time continually result from the tentative, haphazard, and unskilful devices to which teachers of this kind resort. Yet we seem slow to admit the obvious inference from such experience. The art of teaching, like other arts, must be systematically acquired. The profession of a schoolmaster is one for which no man is duly qualified who has not studied it thoroughly, both in its principles and in their practical application."

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* "The Professional Training of Teachers": a paper read at the Bradford Meeting of the Association for promoting Social Science.

The Rev. Evan Daniel, principal of Battersea Normal School, aptly describes the two main classes of middle-class teachers. 1st. University men, "not infrequently of distinguished ability and scholarship. Few of them, however, have had the advantage of professional training. They enter on their work with but a slight knowledge of child-life; they have never studied the pyschological principles on which education should be based; they are almost utterly ignorant of the best modes of teaching, of organising, and of maintaining discipline." These are the teachers, rather the would-be teachers, who, as a distinguished Head Master told us some time ago in the *Times*, are to be allowed to find out their art by victimising their pupils for two whole years before they become worth anything to their profession. But Mr. Daniel also refers to the other class of teachers, who, besides wanting everything that the former class want, also want their mental cultivation, and remain "in a state of intellectual stagnation, discharging their duties in a half-hearted perfunctory spirit, and finding them twice as hard and disagreeable as they need be, from the want of suitable preparation for them.

The arguments then from theory and those from facts meet at this point, and demand with united force that the educator shall be educated for his profession. But how is this to be brought about? What is doing in furtherance of this most important object? The answer to the question must be brief, and shows rather tentative efforts than accomplished facts.

1. The training of teachers for primary schools is going on satisfactorily in the Normal Colleges of the National and British and Foreign School Societies, so that what is asked for middle-class teachers is evidently possible. They can be trained into better teachers than they are.

2. This training of middle-class teachers, which some decry as quackery and others as useless, is actually going on in France and Germany most satisfactorily. In both countries, highly cultivated and efficient educators, with whom the majority of English teachers

would have no chance of competing, are the everyday product of their respective systems of training.

3. Our Government, in the Educational Council Bill, for the present withdrawn, provided "that all teachers of endowed schools should be registered, as persons whose qualifications for teaching have been ascertained by examinations, or by proved efficiency in teaching on evidence satisfactory to the Council;" and that teachers of private schools might also be entered on the registry, by showing similar qualifications.

4. The Scholastic Registration Association, having for its object "the discouragement of unqualified persons from assuming the office of schoolmaster or teacher," has obtained a large share of public approval, and numbers among its members many head-masters of public schools and colleges, as Drs. Hornby, Kennedy, Haig-Brown, (President of the Association), Thring, Collis, Weymouth, Schmitz, Rigg, Donaldson, Jones, Mitchinson, the Revs. E. A. Abbott and F. W. Farrar, and many other distinguished friends of education.

5. The College of Preceptors, too, by the institution of this Lectureship, by the re-constitution of its Examinations for Teachers, and by its recent memorial to the Government on Training Colleges, is showing itself fully alive to the importance of the subject. Its new examinations have just taken place, and candidates have for the first time been examined on the principles of Physiology, Psychology, Moral Philosophy and Logic, and their application to the art of teaching, as well as on their own personal experience as educators. The results have shown how deeply needed is this knowledge of principles; out of fifteen candidates only three have satisfied the examiners. We still hope, however, by placing a high standard before the candidates, and requiring an earnest study of the subjects of examinations, to make our diplomas certificates of real qualification, as far as written and *vivâ voce* examinations can test it.

Yet the real desideratum, after all, is Training Colleges for middle-class teachers, Professorships of Education at our leading Universities, and more, perhaps, than all, a nobler conception of education itself among English teachers.

In order to illustrate, to some extent, the bearing of scientific principles upon educational practice, the papers set at the recent Examination of Teachers at the College of Preceptors are appended. The primary questions, it will be seen, involve principles; the secondary, their application to practice.

COLLEGE OF PRECEPTORS.—EXAMINATION PAPERS.

June, 1871.

THEORY AND PRACTICE OF EDUCATION.

I. PHYSIOLOGY.

(*Third Class Candidates for the Associate's Diploma; having had one year's experience.*)

1. Give a *brief* general view of the functions of the body, and their relation to each other.

(*a.*) How would you apply this knowledge to Education? Show how it may be used in cases of inattention, obstinacy, sullenness, &c., as well as in those of physical weakness, indolence of constitution, &c.

2 Give some account of the process of Respiration and its connection with other functional processes, as well as of the results of its derangement.

(*a.*) What use would you make of your knowledge in teaching the art of Reading aloud?

(*b.*) Mention any defects of Vocalization common among children, and show how you would treat them.

3. Give a brief account of the structure of the Heart, and describe the Circulation of the Blood.

(*a.*) Is blushing under a charge of fault a necessary indication of guilt?

I. PHYSIOLOGY.

(*Second Class Candidates for the Licentiate's Diploma; having had two years' experience.*)

1. Describe generally the functions of the body.

(*a.*) What is the value of a knowledge of Physiology to the educator, with a view to promoting the health of his pupils? Give illustrations.

2. Describe Vesicular Nerve-substance. Distinguish the Cerebrum and the Cerebellum. Explain what is meant by "motor nerves" and "reflex action." What conditions are essential to Sensation?

(*a.*) Can you account for differences of intelligence in different individuals?

(*b.*) Describe any vicious processes of Education which produce unhealthy brain action; and classify the results.

3. How far does the health and mental power of a man depend on the quantity and quality of the air which passes through his lungs?

4. Explain briefly the connection between Physical, Intellectual, and Moral Education.

II. MENTAL AND MORAL SCIENCE.

(*Third Class.*)

1. Why is a classification of the acts of the mind into Memory, Judgment, &c., unsatisfactory?

2. What is meant by Attention? In what respects is it the groundwork of all mental education?

(*a.*) How would you cultivate Attention? how correct Inattention?

(*b.*) How far is Will necessary to Attention, and how would you gain the consent of the Will?

3. What are the characteristics of a good Memory? How would you cultivate Memory?

(*a.*) Distinguish between Rote-Memory and Rational Memory.

4. To what extent (if any) is corporal punishment a legitimate agent in education? How does it act? What are its effects on the moral sense? Compare it with other means of gaining the same end?

II. MENTAL AND MORAL SCIENCE, AND LOGIC.*

(*Second Class.*)

1. What is the relation between Mental and Moral Science?

2. Criticise the usual classification of mental acts, as Perception, Memory, &c.

3. What is Attention? How connected with other modes of intellectual actions?

(*a.*) How would you cultivate Attention?

(*b.*) To what extent is Attention connected with the Will? How would you gain the consent of the Will?

(*c.*) Is it easier to abstract the mind from touches or from sounds? Describe the probable effect on different temperaments of an organ playing a popular air while a lesson is going on. How would you act in the different cases?

4. What are the chief phenomena of Memory? How may Memory be cultivated?

(*a.*) Distinguish between a memory (1) for words, (2) for things, (3) for principles.

(*b.*) What is the connection of Memory with the "Association of ideas."

(*c.*) Describe and discuss different modes of learning Latin Grammar as applications of memory.

(*d.*) How would you cause a pupil to *unlearn?*

5. State and illustrate the law of the "Diffusion of Feeling." What are the doctrines opposed to this law?

(*a.*) Point out the mistakes, in cases of sullenness, sudden and violent passion, and obstinacy, into which an educator ignorant of this law is liable to fall.

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* Some of the logic questions are expected to be answered by every Candidate.

1. "Logic is the Science of the formal Laws of Thought." Explain and criticise this or any other definition of Logic with which you are acquainted.

(*a.*) Give some examples showing the application of Logic to Arithmetic and Grammar.

2. What is the essential difference between the propositions $2 + 1 = 3$, and $a + b = c$?

(*a.*) How may this principle be a guide to the order of teaching? Why not teach Algebra before Arithmetic?

3. Distinguish between Induction and Deduction.

(*a.*) What is the true relation between facts and principles? To what stages of mental development do these processes respectively belong?

(*b.*) Give some applications of Induction to (1) the teaching of languages, (2) the teaching of Science.

4. What is a "connotative" term? What is meant by its "comprehension" and "extension"?

(*a.*) Take from English Grammar a connotative term, and show how you would give the idea of its comprehension and extension.

III. Lesson-giving, Treatment of Cases, and Criticism of Methods.

(*Second and Third Classes.*)

1. Write a sketch of a lesson in "Division of Decimals," stating (1) previous knowledge acquired; (2) the principles to which you would appeal; (3) the order you would adopt in development; (4) the exercises you would give, and the probable answers.

2. (*a.*) A is a child 11 years old, quick in apprehension, deficient in retentiveness, gentle in manners, indifferent to regulations.

(*b.*) B is 13 years old, quick, retentive, wilful, obstinate, pugnacious.

(*c.*) C is 14 years old, of moderate capacity, of indolent temperament, moody, thoughtful in subjects of his own choosing, indifferent in those proposed to him.

Give similarly two other cases. How would you treat each and all in (1) a small school, (2) a large school of six classes?

3. Draw out a time table (30 hours per week) for boys leaving school at (1) 14 years of age, (2) 16 years of age, in Classics, Mathematics, History, Geography, English Grammar, French, Writing, giving reasons for the time you assign. Would you include any other subjects? if so, what, and why?

4. Mention any case of difficulty in (1) Teaching, (2) Discipline, which you have experienced. Describe the causes of your difficulty, state the course you adopted, and what principles of Physiology, Mental and Moral Science, you had in view in adopting such a course, and how far you were successful.

LECTURE II.

THE PRACTICE OR ART OF EDUCATION.

THE Theory of Education, as explained in the former Lecture, consists in an appreciation of the influences which must be brought to bear intentionally, consciously, and persistently on a child, with a view to instruct him in knowledge, develop his faculties, and train them to the formation of habits. It was shown that this view of Education assumes that the educator must himself study and comprehend the nature of these influences; and that this theoretical study, aided by the lessons of experience both personal and that of others, constitutes his own education.

Assuming, then, the education of the educator himself, which involves a due conception of the end in view, we have now to consider some of the means by which he has to realise it, and this constitutes the Practice or Art of Education.

I have already disclaimed the idea of attempting to construct a symmetrical science of education, and am not bound therefore to deduce a symmetrical art from a theoretical ideal. Nor is this necessary; for whatever may be said of the Theory, there is no doubt that the Art of Education exists, and that its fundamental principles can be evolved from its practice.

The Art of Education, strictly considered, involves all the means by which the educator brings his influence to bear on his pupils, and embraces therefore organisation, discipline, school economics, the regulation of studies, &c. Our limited space, however, forbids our entering on these matters, and the "Art of Education" will in this lecture be considered as only another term for Teaching or Instruction.

If we observe the process which we call instruction, we see two parties conjointly engaged—the learner and the teacher. The object of both is the same, but their relations to the work to be done are different. Inasmuch as the object can only be attained by the

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* Delivered at the House of the Society of Arts, on 14th July, 1871; J. G. Fitch, Esq., in the chair.

mental action of the learner, by his observing, remembering, &c., it is clear that what he does, not what the teacher does, is the essential part of the process. This essential part, the appropriation and assimilation of knowledge by the mind, can be performed by no one but the learner; for the teacher can no more think for his pupil then he can walk, sleep, or digest for him. It is then on the exercise of the pupil's own mind that his acquisition of knowledge entirely depends, and this subjective process, performed entirely by himself, constitutes the pupil's art of learning. If however, every act by which ideas from without become incorporated with the pupil's mind in an act which can only be performed by the pupil himself, it follows that he is in fact his own teacher, and we arrive at the general proposition that *learning is self-teaching.* This psychological principle is of cardinal importance in the art of education. We see at once that it defines the function of the teacher, the other party in the process of instruction. It appears, from what has been just said, that the only *indispensable* part of the process—the mental act by which knowledge is acquired —is the pupil's, not the teacher's; and, indeed, that the teacher cannot, if he would, perform it for the pupil. On the other hand, the experience of mankind shows that the pupil, however capable, would not generally undertake his part spontaneously, nor, if he did, carry it to a successful issue. The indispensable part of the process cannot, it is true, be done without the mental exertion of the pupil, but it is equally true that it will not be done without the action and influence of the teacher. *The teacher's part then in the process of instruction is that of a guide, director, or superintendent of the operations by which the pupil teaches himself.**

As this view of the correlation of learning and teaching assumes the competency of the pupil to teach himself, it may of course be theoretically disputed. It is important, then, to add that the child whom the teacher takes in hand has already learned or taught himself a great number of things. He has, in fact, learned the use of his senses, the qualities of matter, and the elements of his mother-tongue, without the aid of any professed teacher. The faculties, however, by the use of which he has made these acquisitions, are the same that he must employ in his further acquisitions, when the action and influence of natural circumstances are superseded by those of the professed teacher.

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* "To teach boys how to instruct themselves—that, after all, is the great end of school-work."—MARKBY.

"The object of all education is to teach people to think for themselves."—"*University Extension,*" an Address delivered at the request of the Leeds Ladies' Educational Association, by James Stuart, Fellow and Assistant Tutor of Trinity College, Cambridge.

A slight review of the operation of these natural circumstances —which we may for convenience' sake call Nature—will serve to suggest some of the means by which the teacher, as a superintendent of the pupil's process of self-instruction, is to exercise his proper action and influence.

How, then, does nature teach? She furnishes knowledge by object-lessons, and she trains the active powers by making them act. She has given capability of action, and she develops this capability by presenting occasions for its exercise. She makes her pupil learn to do by doing, to live by living. She gives him no grammar of seeing, hearing, &c.; she gives no compendiums of abstract principles. She would stop his progress at the very threshold, if she did. Action! action! is her maxim of training; and things! things! are the objects of her lessons. She adopts much repetition in her teaching, in order that the difficult may become easy, "use become a second nature." In physical training, "use legs and have legs," is one of her maxims, and she acts analogously in regard to mental and moral training. She teaches quietly. She does not continually interrupt her pupil, even when he blunders, by outcries and objurgations. She bides her time, and by prompting him to continued action, and inducing him to think about what he is doing, and correct his errors himself, makes his very blunders fruitful in instruction. She does not anxiously intervene to prevent the consequence of his actions; she allows him to experience them, that he may learn prudence; sometimes even letting him burn his fingers, that he may gain at once a significant lesson in physics, and also the moral lesson involved in the ministry of pain.

These are some of the features of Nature's Art of Education, and they are all consistent with the assumptions that throughout her course of instruction the pupil is teaching himself.

We infer, then, from these considerations, that the child whose instruction is to be secured by the guidance of the teacher has already shown his capacity to learn, and to learn, moreover, *without explanations*. We remark, further that an accurate analysis of this process of self-tuition, based on the combined observations and experiments of teachers carefully noted and compared together, and generalised into principles of education, will, no doubt, in time to come, furnish the true canons of the art of teaching, or, in other words, that the pupil's subjective process of learning, when thoroughly understood, will suggest, with proper limitations, the teacher's counterpart objective process of teaching.

The principle I am contending for—that the child is capable of teaching himself without explanations—is indeed very generally acknowledged in word by teachers, who also very generally repudiate it in fact. They allow that it is not what they do for their pupil, but what he does for himself, that gives him strength and independent force: but the multitude of directions, precepts, warnings, exhortations, and explanations, with which they bewilder and enfeeble him, neutralise their theoretical acknowledgment of the principle. Let such teachers say what they will, they virtually deny the pupil's native capacity; they act on the belief that he cannot learn without explanations, and especially without their explanations.

This question of the necessity of explanations is a vital point in our argument, and needs further discussion. Explaining is "flattening," or "making level," "clearing the ground" so as to produce an even surface; and, when applied to teaching, as generally understood, means removing obstructions out of the way, so as to make the subject clear to the pupil, and generally to do this by verbal discourse.

But (1) we notice that Nature, who makes her pupil teach himself, gives no explanations of this kind. She does not explain the difference between hard and soft objects—she says, feel them; between this and that fact—she says, place them side by side, and mark the difference yourself; and generally she says to her pupil, don't ask me to tell you anything that you can find out for yourself.

(2) The question of explanations essentially involves those of the order of studies and the method of teaching. If the subject is unsuited to the pupil's stage of instruction, or if, instead of presenting him with facts which he can understand, we force upon him abstractions which he cannot, we create the need for explanations; and in this case it is not merely probable, but certain, that most of them, however elaborate, will be thrown away. We are in fact, calling on the immature faculties for an effort which is beyond the strength of the trained intellect; for the man has never lived who can understand an abstract general proposition while utterly ignorant of the facts on which it is ultimately founded. But supposing that we admit the value of explanations generally, and that the explanations given are admirably clear in themselves, their

value to the individual pupil will depend, not on their absolute excellence, but on their relation to the condition of his mind. Unless, then, the teacher has well studied that mind, so as to know its individual history, its actual condition, and its needs, much of his explanation will "waste its sweetness on the desert air." That portion only will be received and assimilated for which the previous instruction has prepared the mind, and all the rest will flow away and leave no impression whatever behind it. And, in general, it may be laid down as a practical principle of teaching, that long, elaborate explanations are entirely out of place in a class of children. They do not generally quicken, but rather quell attention. The children, indeed, consider that, though it may be the teacher's duty to preach, it is no necessary part of theirs to heed the preaching. This work, as they generally take it, is the proper occasion for their play; and this play, without outward manifestation, may be going on uproariously in that inner playground where the teacher cannot set his foot. Rousseau, in his interesting if somewhat romantic "Emile," gives the following opinion on this subject—I adopt Mr. Quick's translation:—"I do not at all admire explanatory discourses; young people give little attention to them, and never retain them. Things! things! I can never enough repeat it, that we make words of too much consequence. With our prating modes of education, we make nothing but praters."

Now in these cases the teacher fails because he does not follow Nature. The pupils for whom he "clears the ground" would have cleared it themselves if he had known how to direct them, and would have been the stronger for the exercise.

Having thus indicated Nature's art of teaching, as, in a general way, the archetype of the educator's, it is important now to say that it is not to be implicitly followed.

(1.) *Nature's teaching is desultory.* She mingles lessons in physics, language, morality, all together. Her main business seems to be the training of faculty, and she subordinates to this the orderly acquisition of knowledge by her pupils. We are to imitate Nature in training faculty, but with a definite aim as regards subjects.

(2.) *Nature's teaching is often inaccurate*: not, however, from any defect in her *method*, but from inherited defects in her pupils. If she has not originally given a sound brain, she does not generally herself improve upon her handiwork. The impressions received by a feeble brain become blurred, imperfect conceptions, and Nature often leaves them so. It is the educator's business, however, to endeavour to improve upon her labours,—to ascertain the original fault, and by apt exercise to amend it.

(3.) *Nature's teaching often appears to be overdone.* She gives ten thousand exercises to develop faculty, but she continues to give them when that purpose is answered. The educator is to imitate her in very frequently repeating his lessons, but to cease when the object is gained.

(4.) *Nature does not secure the results of her lessons with a direct aim to mental and moral improvement.* She exercises various powers to a certain extent, and with certain objects; but she does not prompt to their improvement beyond this point, nor exercise them equally upon objects unconnected with animal wants and instincts. We are to imitate Nature in gaining such results for our pupils as she gains, but we are to go beyond her in securing those results as a means to the attainment of a higher platform of knowledge and power.

(5.) *Nature accustoms her pupils to little, and that the simplest, generalisation.* For any care that she takes, the materials suitable for this process may remain unquickened throughout the whole of a man's life. The educator is to imitate Nature in prompting his pupils to generalise on facts, but to surpass her in carrying them forward in practice.

(6.) *Nature is relentless in her discipline.* She takes no account of extenuating circumstances. To disobey is to die. She not only punishes the offender for his own offence, but often makes him suffer for the offences of others. She involves him in all the consequences of his actions, and often gives him no opportunity for repentance. The educator, on the other hand, while allowing his pupil to be visited by the consequences of his actions, is to prevent ruinous consequences—to give him room for repentance, to love the offender whilst punishing the offence, and to allow for extenuating circumstances.

Nature's teaching, then, while in general the model of the educator's, requires adaptation, extension, and correction, in order to make the best use of it. The old adage, "Art improves Nature," applies undoubtedly to the art of education, a truth which even Pestalozzi—certainly himself a choice specimen of Nature's teaching, a head boy in her school—failed, as we shall see, to appreciate.

The upshot of what has been said hitherto is this, that the natural process by which the mind acquires knowledge and power is a process of self-education,—that the educator should recognise that process as a guide to his practice, suggesting both what he should aim at and what he should avoid. To this it is very important to add, that his success in carrying out his object will greatly depend upon his being furnished with the resources of his science. A thousand unforeseen difficulties, arising from the individual personal characteristics of his pupils, will occur in the progress of his work, and demand the exercise of his utmost skill and moral courage for their treatment. It is here, quite as much as in the normal action of the machinery that he is directing, that the value of his own education as an educator will be found. It is the "unusual circumstances" referred to by Mr. Grove, that call for that "plasticity"—that multiform power of applying principles, which distinguishes the scientifically trained from the routine teacher.

I will now illustrate my subject by presenting two typical specimens of the Art of Teaching. In the first the teacher fully recognises the competency of his pupils to learn or teach themselves without any explanations whatever from him, and, accordingly, he gives them none; at the same time, however, he earnestly employs himself in directing the forces under his command, and sees in the self-instruction of his pupils the result of his action and influence. In the second instance the teacher acts on the presumption that the pupil's success depends rather on what is done for him than on what he does for himself.

Suppose that the object be to give a lesson on a simple machine —say the pile-driving machine—in its least elaborate form. I scarcely need say that it consists of two strong uprights, well fastened into a solid, broad block of wood, as a basis, and supplied with two thick ropes, one on each side, which are laid over pulleys at the top of the uprights, and employed to draw up a heavy mass of iron, the fall of which on the head of the pile drives it into the earth. Two or three men at each rope supply the motive power.

Let a large working model of the machine be so placed that all the pupils of the class may see and have access to it. The teacher's object is to make this machine the means of communicating knowledge and of drawing forth their intellectual powers. He has no need to tell them to look at it. The image of it, as a whole, is at once impressed upon their minds. The teacher need not tax his ingenuity to devise methods for gaining their attention. Their attention is already on the full stretch. Their curiosity is largely excited—their eyes wide open, and "unsatisfied with seeing."— "What can it be? What will it do?" He tells them the purpose of it, and nothing more,—"It is a contrivance for driving piles into the ground." They are eager to see it in action.

It is now at rest, the weight resting on the head of the pile. The teacher directs two of the children, one on each side, to lay hold of the ropes and pull up the weight, telling the class that the weight is called a *monkey*—a fact which they will certainly remember. [Names and conventionalities which they cannot find out for themselves, he must, of course tell them; but telling of this kind is not explanation.] Well, the monkey is drawn up gradually, until the clutch relaxes its hold, and down it falls, to their immense delight. This is the first experiment. Let *all the children* try it—and pull up the weight with their own hands, and gain an idea, by personal, individual experience, of the resistance of the weight. This experience involves muscular sensibility, sensation, and a rudimentary notion of force. The children by this time have an idea of the machine, and begin to conceive the relation between the end and the means—between the problem to be solved and the means of solving it. The pile evidently gives way under the repeated blows of the monkey. Let the monkey be weighed, and another substituted heavier or lighter. What is the result now? Use the measuring scale to see exactly how much the pile moves under the different weights. Why are the results different? [These mechanical acts of weighing and measuring exactly are not to be despised; they are fraught with practical instruction.] Next, let the height from which the weight falls be gradually varied, until there is no *height*, and the weight merely rests on the head of the pile, as at first. What is gained by the motion of the weight? Try the experiment many times—weigh, measure, judge. When is weight acting alone?—when along with motion? The children form a conception for themselves of *momentum;* and when the thing is understood the technical name may be given. Next, let the weight be detached and placed on an incline plane—a slanting board. Why does it move now less easily than it did when it was free? Alter the inclination; try all the possible varieties of slope. When is the motion easiest? The pupils gain the idea of *friction,* and may have the name given them. Let the clutch be examined. How does it act? Why hold the weight so firmly at one moment, and let it go the next? Try the experiment, handle it, attach it to the weight. Does it hold the weight *firmly*? Why does it let the weight go at the right moment? Again, suppose the weight were made of wood, lead, putty, &c., instead of iron. Try these substances for the weight. Why are they less suitable for the purpose than iron?

Attach weights to the ropes, and see whether they may be so contrived as to supersede the manual labour. What are the difficulties in doing this? Can they be overcome? What is the use of the pulleys? Remove them, and pull at the ropes without them. What difference is there now in the ease of motion?

Could any one devise another machine for driving piles, or any other contrivance for doing the work of this better? Let every one think of this before the next lesson, and bring his model with him. The teacher sums up the results of the lesson, and tells the pupils to write them down before him. He examines their papers, and makes them correct the blunders themselves. The lesson is concluded.

Now in this lesson we have a typical specimen of the self-teaching of the pupils under the superintendence of the teacher. If teaching means, as stated in books on the subject, the communication of knowledge by the explanations of the teacher, he has taught them nothing. Of that kind of teaching which Mr. Wilson of Rugby calls "the most stupid and most didactic"—meaning that the most didactic is the most stupid—we have here not a trace. The teacher has recognised his true function as simply a director of the mental machinery which is, in fact, to do all the work itself; for it is not he, but his pupils, that have to learn, and to learn by the exercise of their own minds. He has constituted himself, therefore, as (if the expression may be pardoned) a sort of outside will and mind, to act on and co-operate with the wills and minds of his pupils. He is the *primum mobile* which sets the machinery in motion, and maintains and regulates the motion; but the work that it does, the results that it gains, are not his work nor his results, but the machinery's. In the case of the human machinery—the children's minds, which are not dead matter, but living organisms—he has had to supply motives to action, sympathy, and encouragement—to apply, indeed all the resources of his science. But still he is simply the superintendent or director of the operations which constitute the learning or self-teaching of the pupils; and the intrusion of those explanations, which some consider the essence of teaching, would have hindered and frustrated the efficiency of those operations. For, in the case before us, why should he explain, and what has he to explain? The machine is its own interpreter. It answers those who interrogate it in the emphatic and eloquent language of facts—a language which the children understand without explanations; and it practises them abundantly in what Professor Huxley aptly calls the "logic of experiment;" and if it says nothing about abstractions and first principles, which they could not comprehend, it lays before them the proper groundwork for these mental deductions, ready for the superstructure of science when the proper time comes. And until this groundwork of facts is laid, the teacher may strain his mind and break his heart in his anxiety to give explanations. In fact, none that he can give will be equal in value to those given silently, powerfully, and effectually by the machine itself. It is clear, then, that nothing would be gained by his explanations, and that they are therefore unnecessary.

Without dwelling now on all points of interest contained in the lesson that I have described, which will be summarized hereafter, I invite attention especially to two or three.

(1.) We notice the pleasurable feeling of the children thus actively engaged in the free exercise of their own powers—seeing, handling, experimenting, discovering, investigating, and inventing for themselves. This feeling will, by the necessary laws of association, always accompany the remembrance of the lesson. Is not this in itself an immense gain both for teacher and pupils?

But (2) there is another very important gain for the pupils thus educating themselves. It is an approved principle of the science of education that it should be the aim of the educator not merely to train faculty, but to induce in his pupils the power of exercising it without his aid—in other words, to make the pupils independent of the teacher. Now as, in the case before us, the children have gained their knowledge by the exercise of their own faculties—have observed, experimented, &c., for themselves, they cannot but have gained a rudimentary consciousness that they could, without the teacher, go through the same process in acquiring the knowledge of another machine. This consciousness of power may, as I have said, be, at the end of the first lesson, merely rudimentary; but it will gain strength as they proceed, and the final result of such teaching will be that they will acquire the valuable habit of independent mental self-direction. An eminent French teacher used to be laughed at for saying that he was continually aiming to make himself *useless* to his pupils. The silly laughers thought that he had made a blunder, and meant to say—useful. But they were the blunderers.

(3.) It is a noticeable point in the process described that it led the children to discover, investigate, and invent on their own account. They were continually conscious of the pleasure of finding things out for themselves. They were continually making advances, however feeble, in the very path that the first discoverers of knowledge of the same kind, and indeed of every kind, had trod before them. Though only little children, they were unconsciously adopting the method of the scientific investigator, and becoming trained, though as yet but very imperfectly, in his spirit. Should they subsequently give themselves up to scientific inquiry, they will not change their method, for it is even now essentially that of scientific investigation. The value of this plan of learning is aptly pointed out in a well-known passage from Burke's essay on "The Sublime and Beautiful." "I am convinced," he says, "that the method of teaching [or learning] which approaches most nearly to the method of investigation is incomparably the best; since, not content with serving up a few barren and lifeless truths [such as abstractions, general propositions, formulæ, &c.], it leads to the stock on which they grow; it tends to set the reader [or learner] himself on the track of invention, and to direct him into those paths in which the author [or scientific investigator] has made his own discoveries." It is obvious that our children, engaged in investigating and discovering for themselves, were precisely in the position, with regard to their subject, which is described in these words.

But their native inventive faculty was also exercised. They would be sure, before the next lesson, to take the hint given them by the teacher, and would be ready with various contrivances for modifying the pile-driving machine. When I say this I speak from experience, not conjecture. I have myself, when engaged in reading a simple narrative with a class of children, and meeting with a reference to some gate to be burst open by mechanical means, or some bridge to be extemporised in a difficult emergency, simply said, "Try to invent a contrivance for accomplishing these objects, and show me to-morrow your notions by a drawing and description," and have never failed to receive a number of rude sketches of schemes more or less suited to the purpose, but all showing the intense interest excited by the devotion of their minds to the object. I am persuaded that teachers generally overlook half the powers latent in the minds of their pupils; they do not credit children with the possession of them, and therefore fail to call them out. An instructive instance of a different mode of proceeding is furnished by the experience of Professor Tyndall, when he was a teacher in Queenwood School. The quotation is rather long, but it is too valuable to be omitted. "One of the duties," he says, in his Lecture at the Royal Institution, On the

Study of Physics as a branch of Education, "was the instruction of a class in mathematics, and I usually found that Euclid, and the ancient geometry generally, when addressed to the understanding, formed a very attractive study for youth. But [mark the *but!*] it was my habitual practice to withdraw the boys from the routine of the book, and to appeal to their self-power in the treatment of questions not comprehended in that routine. At first, the change from the beaten track usually excited a little aversion; the youth felt like a child among strangers; but in no single instance have I found this aversion to continue. When utterly disheartened, I have encouraged the boy by that anecdote of Newton, where he attributes the difference between him and other men mainly to his own patience; or of Mirabeau, when he ordered his servant, who had stated something to be impossible, never to use that stupid word again. Thus cheered, he has returned to his task with a smile, which perhaps had something of doubt in it, but which nevertheless evinced a resolution to try again. I have seen the boy's eye brighten, and at length, with a pleasure of which the ecstacy of Archimedes was but a simple expansion, heard him exclaim, 'I have it, Sir!' The consciousness of self-power thus awakened was of immense value; and, animated by it, the progress of the class was truly astonishing. It was often my custom to give the boys their choice of pursuing their propositions in the book, or of trying their strength at others not found there. Never in a single instance have I known the book to be chosen. I was ever ready to assist when I deemed help needful, but my offers of assistance were habitually declined. The boys had tasted the sweets of intellectual conquest, and demanded victories of their own. I have seen their diagrams scratched on the walls, cut into the beams of the playground, and numberless other illustrations of the living interest they took in the subject. . . . . The experiment was successful, and some of the most delightful hours of my existence have been spent in marking the vigorous and cheerful expansion of mental power when appealed to in the manner I have described." This is indeed a striking illustration of the true art of teaching, as consisting in the mental and moral direction of the pupil's self-education; and the result, every one can see, was the acquisition of something far more valuable than the knowledge of geometry. They gained, as an acquisition for life, a knowledge of themselves, a consciousness of both mental and moral power, which all the didactic teaching in the world could never have given them. All teachers should learn, and practise, the lesson conveyed by such an example of teaching as this.

Now, taking the former instance as a typical specimen of the art of teaching, let us consider what is involved in it, and gather from it a confirmation of the views already given of the relation of the educator to his pupils, of the Science of Education to the Art.

We see (1) that the pupil, teaching himself under the direction of the educator, begins with tangible and concrete facts which he can comprehend, not with abstract principles which he cannot. He sees, handles, experiments upon the machine; observes what it is, what it does, draws his own conclusions; and thus healthfully exercises his senses, his powers of observation, his judgment; and prepares himself for understanding, at the proper time, general propositions founded on the knowledge that he has acquired.

(2.) That, in teaching himself—in gaining his knowledge—he employs a method, the analytical, which lies in his own power, not the synthetical, which would require the teacher's explanations; yet that he employs also the synthetical, when called on to exercise his combining and constructive faculty. He employed the analytical method in resolving the machine into its parts, its actions into their several constituents and means, and the synthetical when he uses the knowledge thus gained for interpreting other parts and other actions of the machine, and when he applies this knowledge to the invention of other contrivances not actually contemplated by the machine-maker.

(3.) That, in being made a discoverer and explorer on his own account, and not merely a passive recipient of the results of other people's discoveries, he not only gains mental power, but finds a pleasure in the discoveries made by himself, which he could not find in those made by others.

(4.) That, in teaching himself, instead of being taught by the explanations of the teacher, he proceeds, and can only proceed, in exact proportion to his strength, gaining increased knowledge just at the time that he wants it—at the very moment when the increment will naturally become, to use a happy expression of Mr. Fitch, "incorporated with the organic life of his mind." It is needless to add, that he advances, in this self-teaching, from the known to the unknown, for the process he employs leaves no other course open to him.

(5.) That, in teaching himself in this way, he learns to reason both on the relation of facts and the relation of ideas to each other:

and that thus the "logic of experiment" leads him to the logic of thought.

(6.) That, in this process of self-teaching, he acquires a fund of knowledge and of mental conceptions, which, by the natural association of ideas, forms the groundwork or nucleus to which other knowledge and other conceptions of the same kind will subsequently attach themselves; the machine which he knows becoming a sort of alphabet of mechanics, by means of which he will be able to read and understand, in some degree, other machines.

(7.) That the knowledge, thus gained by the action of his own mind, will be clear and accurate, as far as it goes, because it has been gained by his own powers. He may, indeed, have to modify his first notions, to acknowledge to himself that his observations were imperfect, his conclusions hasty; but if not interfered with by unseasonable meddling from without, his mind will correct its own aberrations, and be much the stronger for being required to do this itself. (You will remember Professor Tyndall's experience in teaching geometry.)

(8.) That, by teaching himself in this special case, he is on the way to acquire the power of teaching himself generally, to gain the habit of mental self-direction, of self-power, the very end and consummation of the educator's art.

In order to illustrate my point still more clearly, by force of contrast, I will give a sketch of another mode of teaching, very commonly known in schools, taking the same subject for the lesson as before.

The teacher, whose operations we are now to observe, has a notion—a very common one—that as rules and general principles are compendious expressions representing many facts, he can economise time and labour by commencing with them. They are so pregnant and comprehensive, he thinks, that *if* (your *if* is a great peacemaker) he can but get his pupils to digest them, they will have gained much knowledge in a short time. This remarkable educational fallacy I have already referred to. Our teacher, however (not knowing the science of education, which refutes it), assumes its truth, takes up a book (a great mistake to begin with, to teach science from a book!), and, in order to be quite in form (scientific form being the very opposite to this), reads out from it a definition of a machine: "A machine is an artificial work which serves to apply or regulate moving power;" or another to the same effect: "A machine is an instrument formed by two or three of the mechanical powers, in order to augment or regulate force or motion."

Now the men who wrote these definitions were scientific men, already acquainted with the whole subject, and they summed up in these few words the net result of their observation of a great number of machines, so as logically to differentiate a machine from everything else. Their definitions were intended for the mature minds of students of science, and were therefore framed in a scientific manner. This logical arrangement is, however, the very opposite to that in which the science was historically developed, and which is the only one possible for the child who teaches himself. Our teacher, uninformed in the science of education which disposes of this and so many other questions belonging to the art, implicitly follows the good old way, and reads out, as I have said, the definition of a machine. The pupils, who are quite disposed to learn whatever really interests them, listen attentively, but not knowing anything about "moving power" or "force," nor what is meant by augmenting or regulating it, nor what "mechanical powers" are, at once perceive that this is a matter which does not concern them, and very sensibly turn their minds in another direction. The vivid curiosity and sympathy manifested in the other instance are wanting here. These pupils have no curiosity about the entirely unknown, and no sympathy with the teacher who presents them with the entirely unintelligible. The teacher perceives this, and endeavours to "clear the ground," evidently filled with stumbling-blocks and brambles, by an explanation:—"A machine," he says (no machine being in sight), "is an artificial work, that is, a work made by art." (Boy, really anxious to learn something if he can, thinks, "What is art?" He has heard, perhaps, of the art of painting, but what has a machine to do with painting?) The teacher proceeds: "A machine you see [the children see nothing] is an artificial work (that is, a work made by art), which serves to apply, augment (that is, add to) and regulate (that is, direct) moving force or power; you know what that is of course—[The teacher instinctively avoids explaining the mechanical *force* of a mere idea]—by combining or putting together two or more of the mechanical powers—that is, levers, pulleys, &c.—I need not explain these common words, everybody knows what they mean;—so now you see what a machine is. What is a machine?" A. B. answers, "A machine is a moving power." C. D., "It is something which adds force." "Adds force to what?" C. D. still, "to pulleys and levers." "How stupid you all are!" groans out the teacher, "there is no teaching you anything!" At that moment, E. F., a practical boy, gets a glimmering of the truth, and says, "A steam-engine is a machine." This is an effort of the boy to dash through the entanglement of the words, and make his way up to the facts. The teacher, however, at once throws him back again into the meshes, by saying, "Well, then, apply the definition." Boy replies, "I don't understand the definition." "Not understand the definition! Why, I have explained every word of it;" and so on. He reads the definition again, questions his pupils again upon it with the same result. He perceives that he has failed altogether in his object. All his explanations, which have been nothing more than explanations of *words*, not of *things* (a very common error in teaching), have failed to "clear the ground," which remains as full of stumbling-blocks and brambles as ever. A bright thought strikes him. He introduces a picture of a machine—say of the pile-driving machine—(not the machine itself), and a considerable enlightenment of the darkness at once takes place. There is now something visible, if not tangible. Curiosity and sympathy are awakened, and some of the ends of teaching are secured, and more would be secured but that the teacher still confines himself to reading from his book a description of the machine, though he occasionally interpolates explanations of the technical words that occur. But the picture is, after all, a dead thing; all its parts are in repose or equilibrium; and the pupils, after giving their best attention to it, see in it scarcely any illustration of the terms of the definition through which they have laboured so painfully. The pictured machine represents "moving power" by not moving at all; and "force" by doing nothing, while it leaves the "mechanical powers" an entirely unsolved mystery. They depart from the lesson with a number of confused notions of "moving power," "augmentation of force," "mechanical powers," "pile-driving," "monkeys," and "clutches," while the mental discipline they have acquired is an absolute nullity. Their minds have indeed never once been brought into direct vital contact with the matter they were to learn. The thing itself, the machine, has been withheld from them; nothing but a representation, possibly a misrepresentation, of it, has been seen, at a distance, in a state of dead repose. Instead, therefore, of observing themselves its *action*, they have been told what somebody else has observed; instead of trying experiments upon it with their own hands, they have been treated with a description of somebody else's experiments; instead of being required to form a judgment of their own on the relation of cause and effect, as seen in the action and reaction of forces, they have been made acquainted with the judgments of others, and the general result of the whole lesson probably is, that while they have been, no doubt, deeply impressed with the learning and science of their teacher (and especially of his book), they have left the class still more deeply impressed with the determination that, if this is science, they will have as little as possible to do with it.*

Now the teacher, in this case, may be credited with earnestness, zeal, industry, knowledge of his subject (though he had better have thrown away his book), with all the knowledge in short that goes to the making of a teacher, except (but the exception is rather important) a knowledge of the art of teaching.

These specimens of the art of teaching strikingly illustrate the principles before insisted on. It has been maintained that there is an inherent capacity in the child who has taught himself to speak and walk, to teach himself other things, provided that they are things of the same kind as he has learnt already. Now all children, not being born idiots, are capable of taking part in such a lesson as I have described—can employ their senses upon the concrete matter of the machine, observe its phenomena, make experiments themselves with it, and gain more or less knowledge by this active employment of their minds upon it. And the same would be true of lessons on other concrete matter—on flowers, stones, animals, &c. In fact, these children have been taught all their lives by contact with concrete matter in some shape or other, and the teacher who understands his science will see that there is no other possible path to the abstract. It is obvious, then, that rudimentary lessons on the properties of matter, in continuation of those already received from natural circumstances, should constitute the earliest instruction of a child; and our typical lesson conclusively shows that such instruction is attainable, and most valuable, not only for its own sake, but with a view to mental development.

It is also shown that when the subject of instruction is judiciously chosen, the pupil needs no verbal explanations. The lesson in question is a specimen of teaching in which, in accordance with the theory with which we set out, *all the work* on which the mental acquisition depends *is absolutely and solely done by the pupil*, while the *teacher's action and influence*, which originate and maintain the pupil's work, *is confined to guidance and superintendence.*

Many arguments might be adduced to show that the principle, that *the main business of the teacher is to get the pupil to teach himself*, lies at the basis of the entire art of Instruction. The teacher who, by whatever means, secures this object, is an efficient artist; he who fails in this point fails altogether; and the various grades of efficiency are defined by the degree of approximation to this standard.*

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* "There is no use, educationally, in telling you simply the results to which I have come. But the true method of education is to show you a road, by pursuing which you cannot help arriving at these results for yourselves."—"*University Extension,*" *ubi supra.*

The principle itself is recognised unconsciously in the practice of all the best teachers. Such teachers, while earnestly intent on the process by which their pupils are instructing themselves, generally say little during the lesson, and that little is usually confined to direction. Arnold scarcely ever gave an explanation; and if he did, it was given as a sort of reward for some special effort of his pupils; and his son, Mr. Matthew Arnold, tells us that such is the practice of the most eminent teachers of Germany.

If further authority for the theoretical argument be needed, it may be found in the words of Rousseau, who, recommending "self-teaching" (his own word), says,—"Obliged to learn by himself, the pupil makes use of his own reason, and not that of others. From the continual exercise of the pupil's own understanding will result a vigour of mind, like that which we give the body by labour and fatigue. Another advantage is, that we advance only in proportion to our strength. The mind, like the body, carries only that which it can carry. But when the understanding appropriates things before depositing them in the memory, whatever it afterwards draws from thence is properly its own." Again: "Another advantage, also resulting from this method, is, that we do not accustom ourselves to a servile submission to the authority of others; but, by exercising our reason, grow every day more ingenious in the discovery of the relations of things, in connecting our ideas, and in the contrivance of machines; whereas, by adopting those which are put into our hands, our invention grows dull and indifferent, as the man who never dresses himself, but is served in everything by his servants, and drawn about everywhere by his horses, loses by degrees the activity and use of his limbs." ("Essays on Educational Reformers," p. 135.)

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* "All the best cultivation of a child's mind," says Dr. Temple, "is obtained by the child's own exertions, and the master's success may be measured by the degree in which he can bring his scholars to make such exertions absolutely without aid."

". . . . That divine and beautiful thing called teaching; that excellent power whereby we are enabled to help people to think for themselves; encouraging them to endeavours, by dexterously guiding those endeavours to success; turning them from their error just when, and no sooner than, their error has thrown a luminousness upon that which caused it; carefully leading them into typical difficulties, of which the very path we lead them by shall itself suggest the solution; sometimes gently leading them, sometimes leaving them to the resource of their own unaided endeavours; till, little by little, we have conducted them through a process in which it would be almost impossible for them to tell how much is their own discovery, how much is what they have been told."—"*University Extension*," *ubi supra.*

These views of the fundamental principles involved in the Art of teaching, it will be seen, are not novel. The only novelty is in the mode of stating them. Practical teachers will candidly judge, by reference to their own experience, of their value and importance.

APPENDIX.

I.—ETYMOLOGY OF "LEARN" AND "TEACH."

A brief investigation into the original meaning of these words may be interesting to some readers, as throwing some light upon the theory of the text.

Learn (Old English, *lernen*) is a modification of the primitive English (or Anglo-Saxon) *leorn*-ian, which is itself a derivative of A.S. *lær*-an (Old English, *ler*-en), to teach. The relation between *lær*-an and *lern*-ian is indicated by the fact that in the Mœso-Gothic language, an elder sister of our own English, there was a class of verbs distinguished from certain simpler forms by an epenthetic *n*, which suggested a reflexive or passive meaning. Thus M.G. *luk*-an means to shut or lock up, but *lukn*-an, to lock oneself up, or be locked up; also *wak*-an, to wake another; *wakn*-an, to wake oneself, to be awake. We find traces of this usage in A.S. *eac*-an, to augment; *eacn*-ian, to augment oneself, be pregnant; *drenc*-an, to drench; *drencn*-ian, to drench oneself, be drenched, drown; *awæc*-an, to wake up another; *awæcn*-ian, to wake oneself up, be waked up; and therefore *lær*-an, to teach another; *leorn*-ian, to teach oneself—*i.e.*, to learn.* As, however, the director of a work often gets the credit due to his subaltern, so the person who directed the pupil to learn was formerly said—and the usage still exists provincially—to *learn*, *lern*, or *larn* his pupil. Hence we find in Piers Plowman (v. 4756), "Who *lernede* thee on boke?" also, in Cranmer's version of the Psalms (Ps. cxix. 66), "O *learne* mee true understanding and knowledge;" and, in the "Tempest," Caliban says, "The red plague rid you for *learning* me your language," though he had, in the same sentence, said, "You *taught* me language."

But what does the original root *lær* mean? It is evidently equivalent to M.G. *lais*, *leis*, *les*, *s* being interchangeable with *r*, as in German *eisen* compared with *iron* (Old Eng., *iren*) and *hase* = *hare*. But M.G. *lais* or *les* is identical with German *les* in *les*-en, and signifies to gather together, acquire, glean, as in the provincial word *leasing*, gleaning or gathering up. The primitive meaning of the root A.S. *lær* = M.G., *lais*, *les*, though, as in *learn* = *teach*, the causative sense to make, to gather, acquire, or learn must have been very early superadded. On the whole, then, it appears that to *learn* is to gather up or glean for oneself, *i.e.*, to teach oneself.

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* See on these traces of a passive in ancient English, Rev. Oswald Cockayne's Notes, Nos. 43, 44, appended to his edition of "St. Marharete." (Early English Text Society.)

But the correlative *teach* must be briefly examined. The root appears as *teih*, in M.G. *teih*-en; *zeig*, in German *zeig*-en; *tæc*, in A.S. *tæc*-an; *dic*, *doc*, in Latin *dic*-ere, *di*(*c*)-scere, *doc*-ere; and in Greek *δείκ-νυμι*; and in all these cases means to *point out*, *show*; *direct*, *lead the way*—*i.e.*, teach. Thus *dic*-ere means to show *in words*, to say; *doc*-ere, to show *the way*; *di*(*c*)*scere*, to show oneself the way, to learn. The same idea is conveyed by the French equivalents *montrer* and *enseigner*, both meaning to teach.*

The etymology, then, of both *learn* and *teach* supports, by the instinctive genius of language, the theory that learning is gathering up or gleaning for oneself, and teaching the guiding, directing, and superintending of the process.

II.—ON BOTANY AS A STUDY SUITED TO TRAIN THE OBSERVING POWERS OF CHILDREN.

Since the foregoing Lecture was delivered, I have met with a work which remarkably illustrates the principles on which I have insisted. It is entitled "The First Book of Botany, Designed to Cultivate the Observing Powers of Children. By Eliza A. Youmans. (New York: Appleton and Co.; London: Appleton and Co. Little Britain, 1871)." The method pursued is one by which the pupil teaches himself, by exercising his mind—unaided by the explanations of the teacher—on the flowers, leaves, and objects generally of the vegetable world. It is, therefore, a practical illustration of the principle that "the main business of the teacher is to get the pupil to teach himself," and this little book admirably shows how it may be carried out. In selecting Botany as a subject fitted for this purpose, by the abundance of materials that it furnishes, and by the simplicity of its elementary facts, the author has manifested a wise discretion. Nor is her method a merely theoretical scheme; it is based on practical experience. The object she considers so desirable she has herself accomplished, and her work shows how other teachers may accomplish it also. I cannot do better than present, in the words of the preface, the purpose of the book.

(1.) It lays the foundation for a knowledge of Botany in the only true way, by providing for the actual and regular study of plants themselves. This practice is *enforced* by the plan of the book.

(2.) It provides for a systematic training in the art of observation. The book simply *guides* the pupil, but he must work his own way—examining, searching, comparing, judging, and describing the objects as he finds them.

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* A curious instance of the use of the word *teach* has been pointed out by Mr. Farrar, who quotes Judges viii. 6:—"Gideon took thorns of the wilderness and briars, and with these he *taught* the men of Succoth." Gideon's plan of teaching is hardly yet obsolete.

(3.) This plan first supplies the long recognised deficiency of object-teaching, by reducing it to a method and connecting it with an established branch of school-study. Instead of desultory practice in noting the disconnected properties of casual objects, the exercises are made systematic, and the pupil is trained not only to observe the sensible facts, but constantly to put them in those relations of thought by which they become organised knowledge.

The objects here described are strictly carried out, and we thus have, for the first time, a realization of the idea of Dr. Whewell, who, insisting on the value as a mental discipline, of the exact and solid study of some portion of inductive knowledge, as botany, geology, or chemistry, proceeds,—"But I say the exact and solid knowledge—not a mere verbal knowledge, but a knowledge which is real in its character, though it may be elementary and limited in its extent. The knowledge of which I speak must be a knowledge of things, and not merely names of things,—an acquaintance with the operations and productions of Nature as they appear to the eye, not merely an acquaintance with what has been said about them,—a knowledge of the laws of Nature seen in special experiments and observations, before they are conceived in general terms,—a knowledge of the types of natural forms, gathered from individual cases already familiar. By such study of one or more departments of inductive knowledge, the mind may escape from the thraldom and illusion which reigns in the world of mere words."

These weighty words aptly point out the importance of bringing the mind of the pupil into actual contact with facts and phenomena, as illustrated both in the elementary lesson in mechanics given in the Lecture, and in the systematic lessons in botany contained in Miss Youmans' book.

In view of the supreme importance of such a training as is here suggested for children of all classes, Miss Youmans suggests the introduction of botany into the curriculum of primary instruction, as "*a fourth fundamental branch of study* (*i.e.*, in addition to reading, writing, and arithmetic) *which shall afford a systematic training of the observing powers*"—a suggestion well worth the attention of all teachers who desire to supersede the senseless drill of routine by the processes of intellectual education.

LECTURE III.

EDUCATIONAL METHODS.

THERE is a just distinction between a Method and an Art, and between these and a Science. A Method is a special mode of administering an Art, and an Art is a practical display of a Science. In education, every teacher must have some mode of exhibiting the notions he has of his art, and this mode is his Method. He is practising his art whenever he calls forth the active powers of his pupils, let the subject on which he exercises them be what it may. A simple machine, a flower, a bit of chalk, or a portion of language, may be the means for displaying his art. But if he contents himself with leading his pupils, in a desultory way, from one point of knowledge to another, from one temporary mental excitement to another, he risks their loss both of instruction and education—the one consisting in the orderly acquisition of knowledge; the other in the attainment, through instruction, of good mental habits. The teacher, then, must define his object by a special mode or method for securing it. This method will be the exponent of his notions of the Art of Education, and will be good or bad just as these notions are sound or unsound; and this, again, will depend on his knowledge of the Science of Education—a science, as was before shown, ultimately based on that of Human Nature.

The principle being once admitted, that the instruction aimed at can only be gained by the thinking of the pupil, it follows that the direct object of the teacher is to get the learner to think. The mode of procedure which secures this object in the best way is the best method of teaching. There may, therefore, be many good methods of teaching; but no method is good which does not recognise and appreciate the pupil's natural method of learning. This principle, I repeat, serves as the test of the method employed by the teacher; and it is in this sense that the pupil's subjective process of learning suggests the objective counterpart method of teaching. If the teacher succeeds in getting his pupil to do all the thinking by which the instruction is gained, the method he employs must be a good one; for, to repeat Dr. Temple's words already quoted, "the master's success may be measured by the degree in which he can bring his pupils to make such exertions [*i.e.*, the exertions of their own minds] absolutely without aid." In the system of agencies, then, by which the work of instruction is to be accomplished, the principle, that the pupil's own mental effort alone secures the intended result, is the centripetal force which is ever tending to harmonise the details of the process. Continually acting in opposition to this are the centrifugal forces—volatility, indolence, indifference, &c., which tend to disturb its normal operation. The teacher who commands both these forces, directing the centripetal and controlling the centrifugal, is a master of educational method, and preserves unity of action amidst the endless diversities of his practice.

It follows from the foregoing observations, that as the characteristics of a good method of teaching are suggested and dictated by the characteristics of a good method of learning, it is important to know what is involved in a good method of learning. In the last Lecture I endeavour to show, by an illustrative lesson, what the pupil, under the direction of the teacher, does when engaged in teaching himself a machine. The lesson was, however, presented as typical, and may be applied, *mutatis mutandis*, to other subjects of instruction. It showed that a child can learn the elements of physical science by the exercise of his own mind "absolutely without the aid" of the teacher, except that aid which consists in maintaining the mental force by which the pupil acquires his knowledge. The teacher throughout recognised the native capacity of his pupils to learn, and his method consisted in stimulating that capacity to do its proper work. He gave no explanations, because the machine being its own interpreter, none were needed. He gave no definitions, because all definitions, given in anticipation of the facts on which they are founded, would have been unintelligible; and he properly considered that the true basis of all science is a knowledge of facts. He recognised, in short, throughout the entire lesson, the principle which I have so often insisted on, that his pupils were teaching themselves, and that he was the director of the process.

In order to show what the method of the pupil was, it is necessary briefly to recapitulate the main points of the process. We notice, then—

1. That he began his self-teaching with tangible and concrete matter, on which he could exercise his natural senses.

2. That he employed analysis in gaining his knowledge, and synthesis in displaying and applying it.

3. That he was an explorer, experimenter, and inventor on his own account—a true, however feeble, disciple of the method of scientific investigation.

4. That he proceeded in proportion to his strength, and consequently from the known to the unknown.

5. That the ideas that he gained, being derived by himself from facts present to his senses, were clear and accurate as far as they went.

6. That by teaching himself—relying on his own powers—in a special case, he was acquiring the power of teaching himself generally; and was therefore on the way to gain the habit of independent mental self-direction—the real goal of all the teacher's efforts.

7. That he dispensed with all explanations on the part of the teacher, though he was told the conventional and technical names for things which he already knew.

These are not all, but they are the main, characteristics of the pupil's method of learning elementary science, and indeed of learning everything—language, geometry, arithmetic, for instance—which admits of analysis or decomposition into parts, or which ultimately rests on concrete matter. In learning the imitative arts, the process will be somewhat varied, but the principles remain essentially the same; for it is the same human mind engaged in teaching itself under the direction of the teacher.

All the main characteristics, then, of a good method of teaching are involved in those of the pupil's natural method of learning, that is to say, the teacher must begin his instructions in science, language, &c., with concrete matter—with facts; must exercise his pupil's native powers of observation, judgment, and reasoning; call on him to practise analysis and synthesis; make him explore, investigate, and discover for himself; and so on.

Now it is obvious that, in order to maintain that action and influence by which the pupil's method is to end in complete and accurate knowledge, the teacher must be well furnished with that knowledge of mental and moral phenomena—of human nature in short—which, as I showed in the first Lecture, should constitute his own equipment as an educator. He must know what the mind does while thinking, in order to get his pupils to think correctly. He must also know the normal action of moral forces before he can effectually control the moral forces of his pupils. In short, he must know what education is, and what it can be expected to accomplish, before he can make it yield its best results. Without this knowledge, much of his labour may be misapplied, and, even if not altogether wasted, will be much less productive than it would otherwise have been.

In order to show that these notions respecting the characteristics of a good method are not merely theoretical, I will now quote from an independent source—Mr. Marcel's valuable treatise on Teaching*—what he considers to be the main features of such a method generally.

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* "Language as a means of Mental Culture and International Communication: a Manual of the Teacher and the Learner of Languages." By C. Marcel. Knt. Leg. Hon: French Consul; 2 vols. 12mo; Chapman and Hall, 1853—a work of conspicuous excellence on the whole art of teaching, and well deserving to be reprinted.

First, says Mr. Marcel, "*A good method favours self-teaching;*" and on this point he makes the following apt remarks:—

"One of the chief characteristics of a good method consists in enabling learners to dispense with the assistance of a teacher when they are capable of self-government. It should be so contrived as to excite and direct their spontaneous efforts, and lead them to the conviction that they have the power, if they have the will, to acquire what man has acquired. The prevailing notion that we must be taught everything [that is, by "the most stupid and most didactic method"] is a great evil. . . . . The best informed teachers and the most elaborate methods of instruction can impart nothing to the passive and inert mind. If even a learner succeeded in retaining and applying the facts enumerated to him, the mental acquisition would then be vastly inferior to that which the investigation of a single fact, the analysis of a single combination [*e.g.*, the fact of the pile-driving machine, the combinations it afforded], by his unaided reason, would achieve."

2. "*A good method is in accordance with nature.*"

He adds,—"The natural process by which the vernacular idiom is acquired demonstrates what can be done by self-instruction, and presents the best model for our imitation in devising a method of learning languages." [This is only another way of stating the main proposition, that the method of teaching is suggested by the natural method of learning.]

3. "*A good method comprises Analysis and Synthesis.*"

"Analysis, the method of Nature, presents a whole, subdivides it into its parts, and from particulars infer a general truth. By analysis we discover truths; by synthesis we transmit them to others. . . . . Analysis, consistently with the generation of ideas and the process of nature, makes the learner pass from the known to the unknown; it leads him by inductive reasoning to the object of study, and is both interesting and improving, as it keeps the mind actively engaged. Synthesis [Mr. Marcel here means the synthetic process of the teacher; there is a little confusion in his statement], on the contrary, which imposes truth, and sets out with abstractions, presents little interest, and few means of mental activity in the first stages of instruction. . . . It is, however, necessary for completing the work commenced by analysis. In a rational method we should follow the natural course of mental investigation; we should proceed from facts to principles, and then from principles down to consequences. We should begin with analysis, and conclude with synthesis. . . . In the study of the arts, decomposition and recomposition, classification and generalisation, are the groundwork of creation [*i.e.*, of invention]."

4. "*A good method is both practical and comparative.*"

Mr. Marcel, who has in view especially the learning of language, means, that there should be both practice founded on imitation, and comparison, conducted by the exercise of the reasoning powers. "The former," he says, "exercises the powers of perception, imitation, and analogy; the latter those of reflection, conception, comparison, and reasoning; the first leads to the art, the second to the science, of language. . . . The one teaches how to use a language, the other how to use the higher faculties of the mind. The combination of both would constitute the most efficient system." [It is needless to say that our model lesson on teaching elementary science presented both these characteristics.]

5. "*A good method is an instrument of intellectual culture.*"

This is little more than a repetition of the previous statements. However, Mr. Marcel, in insisting that a good method should cultivate all the intellectual faculties, further remarks, that "through such a method the reasoning powers will be unfolded by comparing, generalising, and classifying the facts of language, by inferring and applying the rules of grammar, as also by discriminating between different sentiments, different styles, different writers, and different languages; whilst the active co-operation of attention and memory will be involved in the action of all the other faculties.

Such are, according to Mr. Marcel, who only represents all the writers of any authority on the subject, the main criteria of a good method of teaching. It is obvious that, though he has chiefly in view the teaching of languages, they strikingly coincide with the deductions we gathered from observing the pupil's own method of learning elementary science. The conclusion, then, appears inevitable, that the characteristics of a good method must be the same, whatever the subject of instruction, and that its goodness must be tested by its recognition or non-recognition of the natural laws of the process by which the human mind acquires knowledge for itself.

Having thus indicated the main criteria of a good method of teaching, I shall employ the remainder of our time in the exposition and criticism of the methods of a few of the masters of the art.

I begin with Roger Ascham's method of teaching Latin, a method characterised by Mr. J. B. Mayor (himself a high authority on education), in his recently published valuable edition of "The

Scholemaster," as "the only sound method of acquiring a dead language."

Ascham gave his pupils a little dose of grammar to begin with. He required them to learn by heart about a page of matter containing a synopis of the eight parts of speech, and the three concords. This was the grammatical equipment for their work. He then took an easy epistle of Cicero. What he did with it may be best learnt from his own words. "First," he said, "let the master teach the childe, cheerfullie and plainlie, the cause and matter of the letter [that is, what it is about], then let him construe it into Englishe, so oft, as the childe may easilie carie awaie the understanding of it. Lastlie, parse it over perfitlie. [The teacher, it is seen, supplies conventional knowledge—the English words corresponding to the Latin—which the child could not possibly find out for himself, and strictly applies the modicum of grammar already learnt.] This done thus, let the childe, by and by, both construe and parse it over againe; so that it may appeare that the childe douteth in nothing that his master taught him before. [This is the reproductive part of the process, involving a partial, mechanical, synthesis.] After this, the childe must take a paper booke, and, sitting in some place where no man shall prompe him, by himself, let him translate into Englishe his former lesson. [This is a test of sound acquisition, and involves a more definite synthesis.] Then showing it [his translation] to his master, let the master take from him his Latin booke, and pausing an houre, at the least, than let the childe translate his owne Englishe into Latin againe, in an other paper booke. [This is the critical test, the exact reproduction by memory, aided by judgment, of the knowledge gained by observation and comparison.] When the childe bringeth it turned into Latin [his re-translation] the master must compare it with Tullies booke [the Latin text of the epistle], and laie them both togither; and where the childe doth well, either in chosing or true placing of Tullies wordes, let the master praise him, and saie, Here ye do well. For I assure you there is no such whetstone to sharpen a good witte and encourage a will to learninge, as is praise." [This last part of the process is especially valuable, involving the correction of faults in the presence of the model, the pupil being really taught, not by the arbitrary dictum of the master, but by the superior authority of the master's master, the author himself.]

In this way, supplying additional grammatical knowledge by the law of exigence, just when it is needed, the teacher finds in the text thus carefully "lessoned," studied, and known by the pupil, "the ground," as Ascham puts it, "of almost all the rewles that are so busilie (anxiously) taught by the master, and so hardlie learned by the scholer, in all common scholes; which after this sort the master shall teach without all error [because founded on facts present to view], and the scholar shall learn withoute great paine; the master being led by so sure a guide, and the scholer being brought into so plaine and easie a waie. And, therefore," he proceeds, "we do not contemne rewles, but we gladlie teach rewles; and teach them more plainlie, sensiblie, and orderlie than they be commonlie taught in common scholes."

We see in Ascham's method, that the concrete preceded the abstract; the particulars, the generalisation; the examples of language, the grammatical rules. He was thus carrying out the spirit of Dean Colet and Cardinal Wolsey, who had insisted, to use the words of the former, that if a man desires "to attain to understand Latin books, and to speak and to write clean Latin, let him above all busily (carefully) learn and read good Latin authors of chosen poets and orators, and note wisely how they wrote and spake, and study alway to follow them, desiring none other rules but their examples." After much more to the same effect, he ends his instructions to the masters of St. Paul's School, by urging that "busy (careful) imitation with tongue and pen more availeth shortly to get the true eloquent speech, than all the traditions, rules, and precepts of masters." Cardinal Wolsey uses nearly the same words in his directions to the masters of Ipswich School.

Into the further details of Ascham's method, so quaintly described in the "Scholemaster," I cannot enter, except to say that, after a long training in double-translations, with the constant application of grammar rules as they are wanted ("the grammar booke being ever in the scholer's hand, and also used by him, as a dictionarie, for everie present use,") the master translates himself easy portions of Cicero into English, and then requires the pupil, *who has not seen the original*, to turn them into Latin. The pupil's work is then to be carefully compared with, and corrected by, the original, "for of good heedtaking springeth chiefly knowledge." This exercise prepares the scholar for independent composition in Latin.

There is one feature especially in this method, as described by Ascham, worthy of careful notice, and that is the *close study of a small portion of literary matter, ending in a complete mastery of it.* The various exercises of the method require the pupil, as Ascham shows, to go over this portion at least a dozen times; and, he adds significantly, "always with pleasure; for pleasure allureth love,

love hath lust to labour, labour always attaineth his purpose." By continually coming into direct contact with the phraseology of the text, the pupil masters the form, and through the form penetrates into the spirit of the author; or, as Ascham phrases it, "by marking dailie and following diligentlie the footsteps of the best authors, the pupil understands their invention of arguments, their arrangement of topics, and hereby," he adds, "your scholar shall be brought not only to like [similar] eloquence, but also to all true understanding and rightful judgment for speaking and writing." It appears, then, that Ascham's pupil proceeds firmly on a broad basis of facts, which he has made his own, by mental conquest, and that this has been possible because the field of conquest has been intentionally limited. It is obvious that no method of teaching which consists in bringing a bit of this thing (or author), a bit of that thing (or author), transiently before the pupil's mind, creating ideas, like dissolving views, each of which in its turn displaces its predecessor, which makes acquisitions only to abandon them before they are "incorporated with the organic life of the mind," can possibly be a good method. Hence the very general result of our systems of education, so called, is a farrago of facts partially hatched into principles, mingled in unseemly jumble with rules half understood, exceptions claiming equal rank with the rules, definitions dislocated from the objects they define, and technicalities which clog rather than facilitate, as they should do, the operations of the mind.

It would be easy to show that the valuable ends of instruction and education can only be gained by *doing a little well;* that the ambition to grasp many things ignobly ends in the loss of the large majority of them (*qui trop embrasse mal étreint*); that apprehension is not comprehension, and generally, that to the characteristics of a good method of teaching we must add this, that it aims at securing *multum*, but not *multa*. If the object of education is training to faculty, to mental self-direction, this principle must be constantly insisted on. I see, however, with the deepest regret, that our educational amateurs—men of the best intentions, but of no practical experience—are continually violating it in their persistent attempts to extend the curriculum of elementary instruction. A little bit of this knowledge, a little bit of that—some information on this point and some on that—is so "useful." They forget that the most useful thing of all is the formation of good mental habits, and that these *can* only be formed by concentrating the mind on a few subjects, and making them the basis of training. When this supremely useful object has been gained, the curriculum may be extended *ad libitum*; but not till then. What is really wanted in primary, and indeed all classes of schools, is not so much more subjects to teach, but the power of teaching the ordinary subjects well. Ascham's method, then, with some slight modifications, presents all the characteristic features of a good method of teaching, and is, I need not point out, identical in principle with that already illustrated. It is natural, simple, effective, although so widely different, in most of its features, from the traditional methods of our grammar schools; which are indeed, in most respects, suited to the mental condition of the ambitious, active-minded, inventive few, but not at all to the ordinary mental condition of the many. We too often forget that the *raison d'être* of the schoolmaster is the instruction, not of the *minority* who *will* and can teach themselves, but of the *majority* who can but *will* not. Our teaching force should regulate the movements rather of the ordinary planets than of the *comets* of the system.

In the seventeenth century a number of thoughtful men—Germans—unsatisfied with the methods of education then in vogue, began almost simultaneously to investigate the principles of education; and, as the result, arrived virtually at the conclusion on which I have so often insisted, that the teacher's function is really defined by that of the pupil, and that it is by understanding what he is, and what he does, that we learn how to treat him wisely and effectively. The eminent names of Ratich, Sturm, and especially Comenius, are connected with this movement. I can do no more than refer those who are interested in the details to Von Raumer's valuable "Geschichte der Pädagogik," or to Mr. Quick's exposition of them in the "Essays on Educational Reformers." The results may be stated in Mr. Quick's words:—

"1. They (the reformers in question) proceed from the concrete to the abstract, giving some knowledge of the thing itself before the rules which refer to it. 2. They employ the student in analysing matter put before him, rather than in working synthetically according to precept. 3. They require the student *to teach himself, under the superintendence of the master*, rather than be taught by the master, and receive anything on the master's authority. 4. They rely on the interest excited in the pupil by the acquisition of knowledge; and renounce coercion. 5. Only that which is understood may be committed to memory."

The methods, then, of these reformers present the same characteristics which we have deductively gained by other means.

In a lecture on methods, it is impossible to omit the names of

Locke and Rousseau. As, however, it is easy to read through the short and very interesting "Treatise of Education" and the capital digest of the "Emile" in Mr. Quick's book, I may pass them over.

We come next to Pestalozzi—a name of world-wide renown, of still increasing influence. He differed essentially from Comenius, whom he practically succeeded in the history of education, in being a comparatively uneducated man. When once reproached by his enemies (of whom, from various causes, he had many) with being unable to read, write, and cipher respectably, he frankly acknowledged that the charge was true. On another occasion he confessed to an "unrivalled incapacity to govern"—a confession which discovered a most accurate self-knowledge on his part; and generally, his whole educational life bore witness to the deficiency of his mental equipment and training. He often bitterly deplored, when he could not remedy, this ignorance and incapacity. His mind, however, was remarkably active and enterprising, and his moral power truly immense. A thousand criticisms on his want of knowledge, of judgment, of the power of government, even of common sense (as men usually estimate that quality), fall powerless as attacks on a man whose unfailing hope, love, and patience not only formed his inward support under trials and disappointments, but combined with that intense necessity of action, which was the essence of his nature, in stamping his moral influence on all around him. Virtue with him was not a mere word: it was an energetic, ever-acting force.* To instruct and humanise the poor wretched children who were generally his pupils,—to relieve their physical wants and sufferings,—to sympathise with them under their difficulties,—was to him not only a duty but a delight. To accomplish those objects he worked like a horse (only harder), fagging and slaving sometimes from three in the morning till eleven at night, dressed himself like a mechanic, almost starved himself, became, as he tells us, "the children's teacher, trainer, paymaster, man-servant, and almost house-maid;" and all this to gain the means for instructing, boarding, sometimes even clothing, children who not unfrequently rewarded his labours with ingratitude and scorn. Pestalozzi was indeed the Howard of schoolmasters.

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* Like most enthusiasts, however, he exercised it very irregularly. On one occasion, we are told, when reduced to the utmost extremity for want of money, he borrowed 400 francs from a friend. Going home, he met a peasant wringing his hands in despair for the loss of his cow. Without a moment's hesitation, Pestalozzi put the purse with all its contents into the man's hands and ran off as quick as he could, to escape his thanks.

It was his unbounded philanthropy that first led him to become a schoolmaster,—his intense love and pity that supplied both motive and means. He saw around him children perishing, as he conceived, for lack of knowledge; and though possessed of little himself, though mentally untrained, though ignorant of the experience of other teachers, he resolved, with such appliances as he had, to commence the work. The one ruling thought in his mind was, "Here are poor, ignorant children. From my heart I pity them. I feel I can do them some good. Let me try."

It is not to be wondered at that his trials often proved "trials" indeed, and ended in utter disappointment: for although his educational instincts furnished him with excellent notions and theories about teaching, the actual results were often unsatisfactory. In this intense eagerness to press forward he never stopped to examine results, nor to co-ordinate means with ends. Provided that he could excite, as he generally did, a vivid interest in the actual lesson, he was contented with that excitement as the end of his teaching. Thus, while he, to some extent, developed the mental powers, he did not even conceive of the higher end of training them to independent action.

In order to show what Pestalozzi's method of teaching really was, I shall quote some passages from an interesting narrative written by Ramsauer, who was first a pupil and then a teacher in one of Pestalozzi's schools.*

Referring to his experience as a pupil, he says, "I got about as much regular schooling as the other scholars—namely, none at all; but his (Pestalozzi's) sacred zeal, his devoted love, which caused him to be entirely unmindful of himself, his serious and depressed state of mind, which struck even the children, made the deepest impression on me, and knit my childlike and grateful heart to his for ever."

Pestalozzi had a notion "that all the instruction of the school should start from form, number, and language; so that the entire curriculum consisted of drawing, ciphering, and exercises in language." "We neither read nor wrote," says Ramsauer, "nor were we required to commit to memory, anything secular or sacred."

"For the drawing, we had neither copies to draw from nor directions what to draw, but only crayons and boards; and we were told to draw 'what we liked.' . . . . But we did not know what to draw, and so it happened that some drew men and women, some houses, &c. . . . . Pestalozzi never looked to see what we had drawn, or rather scribbled; but the clothes of all the scholars, especially the sleeves and elbows, gave unmistakeable evidence that they had been making due use of their crayons." [This is a remarkable specimen of children being left to teach themselves, *without the careful superintendence of the teacher,* and certainly does not recommend the practice.]

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* These quotations are taken from a translation by Mr. Tilleard of Von Raumer's account of Pestalozzi's Life and System, given in the "Geschichte der Pädagogik."

"For the ciphering," Ramsauer says, "we had between every two scholars a small table pasted on mill-board, on which, in quadrangular fields, were marked dots which we had to count, to add together, to subtract, to multiply and divide, by one another." [Here there is obviously some superintendence; the character of it, however, is seen in what follows.] "But as Pestalozzi only allowed the scholars to go over and to repeat the exercises in their turns, and never questioned them nor set them tasks, these exercises, which were otherwise very good, remained without any great utility. He had not sufficient patience to allow things to be gone over again, or to put questions; and in his enormous zeal for the instruction of the whole school, he seemed not to concern himself in the slightest degree for the individual scholar." [These are Ramsauer's words, and they give a curious idea of a superintendence which involved neither knowledge of the nature of the machine, nor a true conception of the end towards which it was working, nor any notion of the corrections necessary to control its aberrations and apply its action to special cases. Yet, as making concrete matter the basis of the abstractions of number, it was good; and good, too, in employing the pupil's own observation, and his analytical and synthetical faculties. Hence we find that Pestalozzi was more successful in teaching arithmetic than anything else.]

Ramsauer proceeds,—"The best things we had with him were the exercises on language, at least those which he gave us on the paper-hangings of the school-room, and which were real exercises on observation." "These hangings," he goes on to say, "were very old and a good deal torn; and before these we had frequently to stand for two or three hours together, and say what we observed in respect to the form, number, position, and colour of the figures painted on them, and the holes torn in them, and to express what we observed in sentences gradually increasing in length. On such occasions he would say, 'Boys, what do you see?' (He never named the girls). *Ans.*—A hole in the wainscot (meaning the hangings). *P.*—Very good. Now repeat after me: I see a hole in the wainscot.

I see a long hole in the wainscot. Through the hole I see the wall. Through the long narrow hole I see the wall. *P.*—Repeat after me: I see figures on the paper-hangings. I see black figures on the paper-hangings. I see round black figures on the paper-hangings. I see a square yellow figure on the paper-hangings. Beside the square yellow figure I see black round figures, &c.

"Of less utility were those exercises in language which he took from natural history, and in which we had to repeat after him; and at the same time to draw, as I have already mentioned. He would say:—Amphibious animals—crawling amphibious animals, creeping amphibious animals. Monkeys—long-tailed monkeys, short-tailed monkeys,—and so on."

Ramsauer adds,—"We did not understand a word of this, for not a word was explained; and it was all spoken in such a sing-song tone, and so rapidly and indistinctly, that it would have been a wonder if any one had understood anything of it, and had learnt anything from it. Besides, Pestalozzi cried out so dreadfully loud and so continuously that he could not hear us repeat after him, the less so as he never waited for us when he had read out a sentence, but went on without intermission, and read off a whole page at once. Our repetition consisted for the most part in saying the last word or syllable of each phrase; thus, "Monkeys—monkeys," or "Keys—keys." There was never any questioning or recapitulation."

This long but interesting account, from the pen of an attached pupil, fairly represents (as we learn from Von Raumer himself, who spent nearly nine months in the school) Pestalozzi's actual teaching, though not the ideal which, in describing results to strangers, he often, in his enthusiasm, substituted for it.

In criticising it, we observe, in the first place, that Pestalozzi's method excites mental action to some extent, but secures the ends neither of instruction nor education. It scarcely at all recognises the self-teaching of the child, but rather supersedes it by the mechanical repetition of the master's words. The observation of the child, called for a moment to the properties of objects, is immediately checked by the resolution, on the part of the teacher, of the lesson on things into a lesson on words. The *naming* of qualities, not ascertained by investigation, but pointed out by the teacher, constitutes what Pestalozzi looked on in theory as a training of the powers of *observation*. Von Raumer, Professors Malden and Mosely, and Herbert Spencer, all agree in their estimate both of the value of Pestalozzi's theory respecting object-teaching, and the comparative worthlessness of his practice. In fact, to hold up a piece of chalk before a class (keeping it in your own hands all the while), to call out "That is chalk," and to make the class repeat after you three times, "That is chalk! that is chalk! that is chalk!" or "Chalk is white," "Chalk is hard," &c., is in no proper sense teaching the properties of chalk, but only the names of its properties. Pestalozzi, however, never saw this, nor that his method generally had no tendency to train the mind. An additional proof of his blindness in this respect was that he drew up manuals of instruction for his teachers which involved in their use a perfectly slavish routine. Thus we learn from his "Book for Mothers," that the teacher, in teaching a child the parts of his own body (which he fancied was the subject to be first taught), is to go, word for word, through a quantity of such matter as this:—"The middle bones of the index finger are placed outside, on the middle joints of the index finger, between the back and middle members of the index finger," &c. Then he compiled a spelling-book containing long lists of words, which were to be repeated to the infant *in its cradle*, before it was able to pronounce even one of them, that they might be deeply impressed on its memory by frequent repetition.

On the whole, then, from Pestalozzi's method *pur et simple*, there is little to be gained. It was much improved subsequently by some of his teachers, Schmid, Niederer, &c., who saw in his theories applications which he failed to see himself. Had be been educated in education,—had he, moreover, profited by the experience of others,—had he brought his practice into conformity with his principles (crude enough though some of these were)—his career, instead of being a series of failures and disappointments, many of them due, however, to his unrivalled "incapacity to govern," would have been one of triumphant success.

As it is, we owe him much. His principles, and much of his practice, are an inheritance that the world will not willingly let die. Let us, however, leave the noble-minded, self-sacrificing Pestalozzi, with all his virtues and all his faults, and pass on to Jacotot.

It should be stated in the outset, that Jacotot was rather an educator of the mind than of all the human forces. He does not appear to have been placed in circumstances which required him to develop and train, by special treatment, the physical and moral powers; although the moral force of his own energetic character, as well as that of his system, could not but be, and was, vitally influential on the whole being of his pupils. It is, however, mainly as a teacher that I propose to consider him.

But some here will enquire who was Jacotot;—a question I have no time to answer in detail. I can merely say that he was born at Dijon in 1770; was educated at the college of that town; at nineteen years of age took the degree of Docteur-és-Lettres, and was appointed Professor of Humanities (*i.e.*, grammar, rhetoric, and composition) in the same college; when the troubles of his country arose, became, at the age of twenty-two, a captain of artillery, and fought bravely at the sieges of Maestricht and Valenciennes; was afterwards made sub-director of the Polytechnic School at Paris; then Professor of the Method of Sciences at Dijon; and later Professor of Pure and Transcendental Mathematics, Roman Law, Ancient and Oriental Languages in different colleges and universities. Obliged, as a marked opponent of the Bourbons, to leave France on their restoration, he took refuge in Brussels, and was in 1818 appointed by the Belgian Government Professor of the French Language and Literature in the University of Louvain; there discovered the method of teaching which goes by his name; devoted the remainder of his life to propagating it; and died at Paris in 1840, being then seventy years of age.

We are told that, as a schoolboy, he displayed some remarkable characteristics. He was what teachers, and especially dull ones, consider a particularly "objectionable" child. He was one of those children who "wanted to know, you know," why this thing was so; why that other thing was not. He showed little deference, I am afraid, to the formal, didactic prelections of his teachers. Not that he was idle; far from that. We are told that he delighted in the acquisition of all kinds of knowledge that could be gained by his own efforts, while he steadily resisted what was imposed on him by authority; admitting nothing which was *primâ facie* contestable; rejecting whatever he could not see clearly; refusing to learn by heart grammars, or, indeed, any mere digests of conclusions made by others. At the same time he eagerly committed to memory passages of authors which pleased him, thus spontaneously preferring the society of the "masters of the grammarians" to that of the grammarians themselves. Even as a child, nearly everything he knew he had taught himself. He was, in short, ill adapted to be a pupil of any of those methods which, in Mrs. Pipchin's fashion, are intended to open the mind of a child like an oyster, instead of encouraging it to develop like a flower. As a Professor, his rooms were always crowded with eager pupils; and his inaugural address, at Louvain, was received, we are told by one who was present, with an enthusiam like that which usually greeted Talma on the stage.

His style of teaching, as a Professor, before the invention of his method, was striking and original. Instead of pouring forth a flood of information on the subject under attention from his own ample stores, explaining everything, and thus too frequently superseding, in a great degree, the pupil's own investigation of it, Jacotot, after a simple statement of the object of the lesson, with its leading divisions, boldly started it as a quarry for the class to hunt down, and invited every member to take part in the chase. All were at liberty to raise questions, make objections, and suggest answers, to ask for facts as the basis of arguments, to repudiate mere didactic authority. During the discussion, the teacher confined himself to asking questions, to suggesting now and then a fresh scent, to requiring clear statements and mutual courtesy; but of teaching, in the popular sense of the term, as consisting in the authoritative communication of knowledge, there was little or none. His object throughout was to excite, maintain, and direct the intellectual energies of his pupils—to train them to think. The lesson was concluded by his summing up the arguments that had been adduced, and stating clearly the results obtained.*

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* Mr. Wilson, of Rugby, in his admirable paper in the "Essays on a Liberal Education," thus describes, in almost identical terms, what he considers a proper method of teaching science: —

"Theory and experience alike convince me that the master who is teaching a class quite unfamiliar with scientific method, ought to make his class teach themselves, by thinking out the subject of the lecture with them, taking up their suggestions and illustrations, criticising them, hunting them down, and proving a suggestion barren or an illustration inapt; starting them on a fresh scent when they are at fault, reminding them of some familiar fact they had overlooked, and so eliciting out of the chaos of vague notions that are afloat on the matter in hand—be it the laws of motion, the evaporation of water, or the origin of the drift—something of order, and concatenation, and interest, before the key to the mystery is given, even if, after all, it has to be given. Training to think, not to be a mechanic or surveyor, must be first and foremost as his object. So valuable are the subjects intrinsically, and such excellent models do they provide, that the most stupid and didactic teaching will not be useless, but it will not be the same source of power that "the method of investigation" will be in the hands of a good master. Some few will work out a logic of proof, and a logic of discovery, when the facts and laws that are discovered and proved have had time to lie and crystallize in their minds. But imbued with scientific method they scarcely will be, unless it springs up spontaneously in them."—("On Teaching Natural Science in Schools."—*Essays an a Liberal Education*, pp. 281, 282.)

We come now to the origin of Jacotot's method. In entering on his duties at Louvain he found that he had to lecture to students, many of whom knew nothing of French. As he was himself ignorant of Flemish, the problem was, how to teach them, He solved it in this way. He put in their hands copies of Télémaque, which contained a Flemish translation, not literal, on the opposite page. After some exercises in pronunciation he directed the students, through an interpreter, to commit to memory a few sentences of the French text, and gather their general meaning from the version in their own language. They were told, on the second day, and for several days, to add other portions in the same way, while carefully repeating from the beginning. This process, the laying in of materials, was repeated until a page or two of the book was thoroughly known—that is, known so that the pupils could go on with any sentence of the French text from memory, when the first word was given, or quote the whole sentence in which any given word occurred, while they had at the same time a general idea of the meaning. The teacher now began, through his interpreter, to put questions, in order to test their knowledge, not only of the sentences, as wholes, but also of the component phrases and words. As the process of learning by heart, and repeating from the beginning, went on, the questions became more close and specific, so as to induce in the pupils' minds an analysis of the text into its minutest elements. When about half the first book of Télémaque was thus intimately known, Jacotot told them to relate in their own French, good or bad, the substance, not the exact words, of this or that paragraph of the portion that they knew, or to read a paragraph of another part of the book, and write down or say what it was about. He was surprised at their success in this synthetic use of their fund of materials. He praised their achievements; saw, but took no notice of, the blunders; or if he did, it was simply to require the pupils to correct them themselves by reference to the text (just as Ascham did). He reckoned on the power of the process itself, which involved an active exercise of the mind, to correct blunders which arose from inadvertence. In a very short time, these youths, learning, repeating, answering questions, were able to relate anything that they had first read over. Compositions of different kinds, their text furnishing both subjects and language, were then given, and it was found that as they advanced they spontaneously recognised in their practice the rules of orthography and grammar (without having learned them), and at length wrote a language not their own better (as Jacotot somewhat extravagantly declared)—that is, with a more complete command of the force, correctness, and even graces of style—than either himself or any of his colleagues.

All were surprised at the result of his experiment, but Jacotot alone perceived the principles involved in it. He saw—

(1.) That his pupils had learned French, not through his knowledge of it—the circumstances forbade that—but through the exercise of their own minds upon the matter of the text, which they had committed to memory. If they had had any teacher, the book had been their teacher. It was from that source they had derived all their knowledge, and the exercise of their observing, remembering, comparing, generalising, judging, and analysing powers upon it had supplied them with the materials they employed in their synthetic applications.

(2.) He saw that, though he had been nominally their teacher, they had really taught themselves,—that the acquisitions they had made were their own acquisitions, the fruit of their own mental exertions,—that the method by which they had learned was really their method, not his.

(3.) He deduced from this observation, that the function of the teacher is that of an external moral force, always in operation to excite, maintain and direct the mental action of the pupils,—to encourage and sympathise with his efforts, but never to supersede them.

After awhile Jacotot presented, in the form given below, the result of his meditations on the principles involved in his experiments. This precept for the guidance of the teacher, is in fact—as will be at once seen—an epitome of the method of the learner, and indeed of all learners, whatever be their age, or the subject they may wish to learn so as really to know.

This, then, is the fundamental precept of Jacotot's method:—*Il faut apprendre quelque chose, et y rapporter tout le reste; i.e.*, the pupil must learn something, and refer all the rest to it. When further explanation was demanded, he would reply to this effect:—

(1) *Learn—i.e.*, learn so as to know thoroughly, perfectly, immoveably (*imperturbablement*), as well six months or twelve months hence as now—something, a portion of a book, for instance. (2) *Repeat* that something, the portion learned, incessantly—*i.e.*, every day or very frequently (*sans cesse*), from the beginning, without any omission, so that no part of it be forgotten. (3) *Reflect* upon the matter thus acquired—analyse it,

decompose it, re-combine the elements, make it a real mental possession in all its details, interpret the unknown by it. (4). *Verify*—test general remarks—*i.e.*, grammatical and other rules—by comparing them with the facts—the phraseology and constructions which you already know. In brief, *learn*, *repeat*, *reflect*, *verify*; or, if you like, *learn*, *verify*, *repeat*, *reflect*; so that you *learn* first, the order of the other processes is unimportant. Know facts, then; bring all the powers of the mind to bear upon them; and repeat what you know, to prevent its being lost. This is the method of Jacotot, which may be otherwise represented thus:—

In all your learning, do homage to the authority of facts.

(1) *Apprenez.*—Learn them accurately; grasp them firmly; apprehend, so as to know them.

(2) *Rapportez.*—Compare them with each other, interpret one by another, make the known explain the unknown, generalise them, classify them, analyze them into their elements, re-combine the elements, attach new knowledge to the pegs already fixed in your mind.

(3) *Répétez.*—Don't let the facts slip away from you. To lose them, is to waste the labour you spent in acquiring them. Keep them, therefore, continually before you by repetition.

(4) *Vérifiez.*—Test general principles, said to be founded on them, by confronting them with your facts. Bring your grammatical rules to the facts, and explain the facts by them.

In all this process, the pupil is employing natural means for a natural end. He is doing what he did in the case of the pile-driving machine—observing, comparing, investigating, discovering, inventing; and if we apply the tests—Mr Marcel's or any other—of a good method, we find them all in this, which is the method of the pupil teaching himself under the direction of the master.

It is, in short, as said before, the method by which all learners—whether the little child in nature's infant school, or the adult man in the school of science—learn whatever they really know. In both cases, the essential basis of all mental progress is a knowledge of facts—a knowledge which, to be fruitful, must be gained at first hand, and not on the report of others, must be strict and accurate, and must be firmly retained. These are the essential conditions for the subsequent operations by which knowledge is appropriated, assimilated, and incorporated with the organic life of the mind. On this point, however, I cannot further dwell.

In order to make the principles of Jacotot's method clearer by a practical example, I will give, in some detail, an account of his plan of teaching Reading.

In this method, the sacred mysteries of *b-a, ba; b-e, be*, in pronouncing which, Dr. Bell gravely tells us, "the sound is an echo to the *sense*," are altogether exploded; those *columns* too, all symmetrically arranged in the vestibule of the temple of knowledge, to the dismay of the young pilgrim to its shrine, are entirely ignored. The sphynx of the alphabet never asks him what *see-a-tee* spells, nor devours him if he fails to give the impossible answer, *cat*. The child who has already learnt to speak by hearing and using whole words, not separate letters—saying, *baby*, not *bee-a-bee-wy*—has whole words placed before him. These words are at first treated as pictures, which have names that he has to learn to associate with the forms, in the same way which he already calls a certain shaped animal a *cow*, and another a *dog*, and knows a certain face as *mamma's*, and another as *papa's*. Suppose we take a little story, which begins thus:—

"Frank and Robert were two little boys about eight years old."

There is, of course, a host of reasons to show the unreasonableness of beginning to teach reading by whole words. We ought, we are told, to begin with the elements, put them together for the child, arrange words in classes for him, keep all difficulties out of his way, proceed step by step from one combination to another, and so on. Reflecting, however, that Nature does not teach speaking, nor give her object-lessons in this way, but first presents wholes, aggregates, compounds, which her pupil's analytic faculty resolves into their elements, the teacher sets aside all these speculative difficulties; and believing in the native capacity of the child to exercise on printed words the same powers which he has already exercised on spoken words, forms the connection between the two by saying to the child, "Look at me" (not at the book). He then very deliberately and distinctly, but without grimacing, utters the sound "Frank" two or three times, and gets the child to do the same repeatedly, so as to secure from the first a clear and firm articulation. He then points to the printed word, repeats "Frank," and requires the child, in view of it, to utter the same sound several times. The first word is learned and known. The teacher adds "and." The child reads "Frank and." The teacher adds "Robert." The child reads "Frank and Robert." The teacher asks, "Which is 'Robert'? 'and'? What is that word?" (pointing to it), "and that?" &c. The teacher says, "Show me 'and,' 'Robert,' 'Frank,' in the same page—in any page."

The same process is repeated with the rest of the words of the sentence, and comes out thus:—

Frank
Frank and
Frank and Robert
Frank and Robert were, &c.;

the pupil is told each word once for all, and repeats from the beginning, that nothing may be forgotten. By thus (1) learning, (2) repeating, he exercises perception and memory.

Suppose that the next sentences are—

"They were both very fond of playing with balls, tops, and marbles.

"One day, as they were playing in the garden, it began to thunder very loud and to rain very hard.

"So they ran under the apple tree."

All the words of these sentences may be gradually learned, in the same way, in four, six, or ten lessons. There is no need for haste. The only thing needful is accurate knowledge—to have something (*quelque chose*) thoroughly, perfectly, immoveably known (*imperturbablement apprise*).

The child has up to this point imitated the sounds given him, has associated them with the signs, has exercised observation and memory: so that wherever he meets with these words in his book, the sign will suggest the sound—or given the sound, he will at once point out the sign.

The teacher may now, if he thinks fit, begin to exercise the child's analytical and inductive faculties; not, however, necessarily on any symmetrical plan. He says, "Look at me," and pronounces very distinctly *f-rank*, repeating the process in view of the printed word. He does the same with *f-ond* and *f-ast*, and asks the child, "Which letter is *f*?" (the articulation not the name *ef*). The child points it out, and in this way *f* (that is, the articulation, the power of it) is learned and known.

The teacher covers over the *f* in *frank*, and asks what is left. The child replies "rank." The teacher proceeds as before, uttering *r-ank*, and requiring the child to read for himself *R-obert*, *r-ain*, *r-an*, and thus the articulation of initial *r* is mastered. In the same way, the articulation *l* is gained from *l-ittle* and *l-oud*. Nor do the mutes, as *b* and *p*, present any difficulty. The utterance of *b-oys*, *b-oth*, *b-alls*, *b-egan* suggests the necessary configuration of the organs, and the function of these letters is appreciated.

The teacher may next, if he pleases, though it is not necessary to anticipate the natural results of the process, try the synthetic or combining powers of the child. He writes on the black-board, in printing letters, the words *fold, falls, fops, fain, frond, fray, ray, rap, lank, flank, last, loth, lops, let, lair, lap, bank, bat, bold, bay, blank,* &c., and requires the child, *without any help whatever,* to read them himself. Most children will do this at once. If there is any difficulty, a simple reference to the words *Frank, little, boys,* &c., without any explanation, will immediately dispel it.

It is not necessary, I repeat, for the teacher thus to anticipate the inevitable results of the process. The quickened mind of the pupil will, of its own accord, analyse and combine, in its natural instinct to interpret the unknown by the known. The only essential parts of the process are learning and repeating from the beginning; all the rest depends on these. And in guiding the mind of the pupil to the intellectual use of his materials, the teacher should be under no anxiety about the length of the process. He should often practise a masterly inactivity; should know how to gain time by losing it—to advance by standing still. If he have a genuine belief in the native capacity of his pupils' minds, he need have no fear as to the result. The pupil (1) learning, (2) repeating, (3) reflecting—*i.e.*, analysing, or de-composing, (4) re-combining, is all along employing his active powers as an observer and investigator, and learns at length to read accurately and to articulate justly. The names of the letters may be given him when he has thus learnt their powers. It is a convenience, nothing more, to know them. The young carpenter saws and planes no better for knowing the names of his tools.

Such, then, is Jacotot's method applied to the teaching of Reading. It ought, by theory, to accomplish this object, and it *does.* While philosophers are discussing the propriety of learning a subject without beginning *secundum artem* at what they call the beginning, the child, like the epic poet, dashes *in medias res,* and arrives at the end long before the dicussion is over. A young investigator of this school, initiated in the habit of actively employing his mind on the subject of study, laughs at the ingenious arrangements, however kindly meant, furnished by various spelling-book makers, to aid him in his career. He turns aside from *ram, rem, rim, rom, rum—adge, edge, idge, odge,* and *udge,*—indeed, from all the scientific permutations made for him on the assumption that he cannot make them himself. He is told that there is a go-cart provided to help him to walk,—that the food is ready minced for his eating: but he chooses to walk and comminute his food for himself. Why should we prevent him?

This method is essentially the same as Mr. Curwen's "Look and Say Method," and that of the little book entitled "Reading without Spelling, or the Teacher's Delight;" the only difference being that the teacher here employs the process consciously as a means of developing and training the mental powers as well as of teaching to read, of education as well as of instruction.

My pleasant task is now done. I have left much unsaid that I wished to say; and, in criticising others, have, no doubt, exposed myself to criticism. As that is the common lot, I ought not to complain of it. I will, in conclusion, go over the main points which I have touched upon in the three lectures.

In my first Lecture I endeavoured to show that education is both a science and an art, and that the principles of the science account for, explain, and give laws to the processes of the art; that the educator's own education is incomplete without a knowledge of these principles, which are ultimately grounded on those of Physiology, Psychology, and Ethics; that this knowledge is useful, not only in its application to the normal phenomena occurring in practice, but especially to the abnormal, which demand for their treatment all the resources of the science; that knowledge of this kind is comparatively rare amongst educators, and that its rarity is the main cause of the unsatisfactory condition of much of our education.

In the second Lecture, assuming the education of the educator, and confining myself to teaching, or the art of intellectual education, I endeavoured to show that the teacher ought, in the first place, to have a just conception of his relation to his pupil; that this was gained by his seeing in the child one who had learned, or taught himself, all that he already knew, and in inferring, therefore, that it was his business to continue the process already begun; that it thus appeared that the child's process of learning was, to a great extent, a guide to the teacher's process of teaching, and that the joint operation in which both were engaged resolved itself into the superintendence, or direction, by the teacher, of the pupil's method of self-instruction.

In this Lecture I have shown that a *method* of teaching any subject is a special mode of applying the *art* of teaching; that to be a good method it must have certain characteristics, deduced from successful practice, and ultimately referable to the principles of the science of education, and I have described, and to some extent criticised, a few well-known methods.

My simple aim, in these Lectures, has been to lead the educator to form a high idea of his work; to show that there are principles underlying his practice which it is important for him to know, and to induce him to study and apply them, not only for his own sake, but as a protest against the despotism of routine, which has so long hindered education from claiming its professional rights in England. I trust I have not altogether failed to accomplish my purpose.

APPENDIX.

I.—THE RELATIVE CLAIMS OF SCIENCE AND LITERATURE IN THE CURRICULUM OF SCHOOL INSTRUCTION.

Lest it should be supposed that the writer believes that the teaching of science ought to constitute of itself the curriculum of school instruction, or indeed to form its vital characteristic, he begs to append an extract from a lecture he delivered at the College of Preceptors in 1866, on "The Curriculum of Modern Education." This passage will show his opinion of the relative value of scientific and literary instruction generally, and is quite consistent with the argument advanced in these lectures, that the *earliest instruction* of children ought to be a *continuation* of the natural process by which they have learnt what they already know, and that this rudimentary course of practice in the art of observing and discovering is the best preparation both for scientific and literary studies. It is for the sake of literary studies themselves, and in order that they may be more efficiently pursued by applying to them the method of scientific instruction, that the writer recommends the preliminary training of the mind on natural objects. All teaching, whatever be its subject, should be scientific in its spirit, if it is to be really quickening. How far the ordinary grammar-school instruction is so may be seen by the evidence given before the Public Schools Commission of 1862–3, the general result of which is thus pithily stated by the Senior Censor of Christ Church:—"The mass of young men, on entering the University [from the public schools], have everything to learn, and no desire to learn anything. In fact, very few of those who are candidates for matriculation can construe with accuracy a piece from an author whom they profess to have read. We never try them with an unseen passage; it would be useless to do so." The Junior Censor of Christ Church adds,—"The average men [from the public schools] bring up but small results of the training to which they have been subjected for years. There is a general want of accuracy in their work. . . . . They come up to us with very unawakened minds, and habits of mental indolence and inaccuracy." A third witness, a public examiner of Oxford, also testifies that "the boys are not well grounded in the subjects to which most of their time has been given; and on other points, less strictly academical, their ignorance is sometimes surprising. . . . The mass of boys sent out from

Eton are very ignorant indeed." It is difficult to believe that the teaching which produces such results as these can be scientific in its character or quickening in its spirit.

"If science, then, is to constitute a real discipline for the mind, much, nay everything, will depend on the manner in which it is studied. In the first place, it is to be remembered that the pupil is about to study things, not words; and therefore treatises on science are not, in the first instance, to be placed before him. He must commence with the accurate examination of the objects and phenomena themselves, not of descriptions of them prepared by others. By this means, not only will his attention be excited, the power of observation previously awakened much strengthened, and the senses exercised and disciplined, but the very important habit of doing homage to the authority of facts, rather than to the authority of men, be initiated. These different objects and phenomena may be placed and viewed together, and thus the mental habits of comparison and discrimination may be usefully practised. They may, in the next place, be methodically arranged and classified, and thus the mind may become accustomed to an orderly arrangement of its knowledge. Then the accidental may be distinguished from the essential, the common from the special, and so the habit of generalization may be acquired; and lastly, advancing from effects to causes, or conversely from principles to their necessary conclusions, the pupil becomes acquainted with induction and deduction—the processes of the highest value and importance. It is no small advantage, moreover, that this kind of study affords, both in its pursuit and its results—both in the chase and the capture—a very large amount of legitimate and generous mental pleasure, and of a kind which the pupil will probably be desirous of renewing for himself after he has left school. After all, however, it will be observed, that while the study of the physical sciences tends to give power over the material forces of the universe, it leaves untouched the greater forces of the human heart: it makes a botanist, a geologist, an electrician, an architect, an engineer, but it does not make a man. The hopes, the fears, the hatreds, and the loves; the emotions which stir us to heroic action, the reverence which bows in the presence of the inexpressibly good and great; the sensitive moral taste which shrinks from vice, and approves virtue; the sensitive mental taste which appreciates the sublime and beautiful in art, and sheds delicious tears over the immortal works of genius—all this wonderful world of sensation, emotion, and thought lies outside of that world which is the especial object of the study of the physical sciences." ("The Curriculum of Modern Education," pp. 18, 19.)

LIST OF BOOKS ON EDUCATION.

SUITABLE FOR THE STUDY OF CANDIDATES FOR THE DIPLOMAS OF THE COLLEGE OF PRECEPTORS.

[Those marked * are the most important.]

SCIENCES ON WHICH THAT OF EDUCATION IS BASED.

Physical Education.

Dr. Carpenter's Animal Physiology. (*Bell and Daldy.*)
*Dr. Southwood Smith's Philosophy of Health. (*Longmans.*)
*Huxley's Lessons in Elementary Physiology. (*Macmillan.*)
*Dr. Andrew Combe's Principles of Physiology, applied to the preservation of Health, and the improvement of Physical and Mental Education. (*Simpkin.*)

Psychology and Ethics.

*Bain's The Senses and the Intellect. (*Longmans.*)
*Bain's The Emotions and the Will. (*Longmans.*)
*Bain's Mental and Moral Science; a compendium of Psychology and Ethics. (*Longmans.*)
*Morell's Introduction to Mental Philosophy on the Inductive Method. (*Longmans.*)
*Mansell's Metaphysics; or, the Philosophy of Consciousness. (*Black.*)
Beneke's Elements of Psychology. Translated from the German. (*Parker.*)
Dugald Stewart's Moral Philosophy. (*Low.*)
Abercrombie's Inquiries concerning the Intellectual Powers. (*Murray.*)
Abercrombie's Philosophy of the Moral Feelings. (*Murray.*)
Locke's Essay on the Human Understanding. (*Tegg.*)

Logic.

*Jevons's Elementary Lessons in Logic. (*Macmillan.*)
*Bain's Inductive and Deductive Logic. 2 vols. (*Longmans.*)
*J. S. Mill's Logic. 2 vols. (*Longmans.*)
Archbishop Thompson's Laws of Thought. (*Longmans.*)
Whately's Logic. (*Longmans.*)

THEORY AND PRACTICE OF EDUCATION.

Theory mainly.

*Herbert Spencer's Essays on Education, Physical, Mental, and Moral. (*Williams and Norgate.*)
*Lectures on Education, delivered at the Royal Institution, by Whewell, Faraday, Latham, Daubeny, Tyndall, Paget, and Hodgson. (*Parker.*)
Jacob Abbott's "Teacher." Mayo's edition. (*Hatchard.*)
*Rousseau's Emile. (Paris.)
*Marcel's Language as a means of Mental Culture. 2 vols. (*Chapman and Hall.*)
Tate's Philosophy of Education. (*Longmans.*)
Craig's Philosophy of Training: or, the Principles and Art of a Normal Education. (*Simpkin.*)
Essays on a Liberal Education. By Seeley, Farrar, Parker, J. M. Wilson, Johnson, and Hales. (*Macmillan.*)
The Claims of Scientific Education. Addresses and Arguments by Tyndall, Henfrey, Huxley, De Morgan, Carpenter, Herschell, &c. Edited by Dr. Youmans. (*Macmillan.*)
Locke on Education. St. John's edition. (*Hatchards.*)
Stow's Training System. (*Longmans.*)
Fleury's Traité du Choix et de la Méthode des Études. (Paris, 1759.)
Milton's Tractate on Education.

Practice mainly.

*Edgeworth's Practical Education. 2 vols. (*Baldwin.*)
*Currie's Principles and Practice of Early and Infant School Education, and of Common School Education. 2 vols. (*Laurie.*)
*Gill's Introductory Text Book to School Education, Method, and School Management. (*Longmans.*)
Home and Colonial School Society's Manual of Elementary Instruction. 2 vols. (*Hamilton and Co.*)

*Home and Colonial School Society's Model Lessons. (*Hamilton and Co.*)

Home and Colonial School Society's Practical Remarks on Early Education. (*Hamilton and Co.*)

Manual of Human Culture. By Dr. Garvey. (*Bell and Daldy.*)

*Dunn's Principles of Teaching. (*Sunday School Union.*)

Wilderspin's Infant Education. (*Hodson.*)

Josephi Juvencii Ratio Discendi et Docendi. (Paris.)

Wood's account of the Edinburgh Sessional School. Edinburgh: (*Wardlaw.*)

*Pillan's Rationale of Discipline. (*Taylor and Walton.*)

*Dean Dawes's Suggestive Hints towards improved Secular Instruction. (*Groombridge.*)

EDUCATIONAL METHODS.

Jullien's Esprit de la Méthode de l'Education de Pestalozzi. 2 vols.

*Joseph Jacotot's Langue Maternelle et Langue Étrangère. 2 vols. (Paris.)

*Fred. Jacotot's L'Enseignement universel mis à la portée de tous les pères de famille. (Paris.)

*Ascham's Scholemaster, J. B. Mayor's edition. (*Bell and Daldy.*)

*Prendergast's Mastery System. (*Longmans.*)

Nasmith's Practical Linguist. (*Nutt.*)

Reading Disentangled. (*Stanford.*)

Letters from Hofwyl on the Educational Institutions of De Fellenberg. (*Longmans.*)

LIVES OF EMINENT EDUCATORS.

*Quick's Essays on Educational Reformers. (*Longmans.*)

Horace Mann's Life. Boston (U.S.)

*Von Raumer's Life and System of Pestalozzi. Translated from the Geschichte der Pädagogik, by J. Tillcard. (*Longmans.*)

*Life and Correspondence of Dr. Arnold. By Dean Stanley. (*Fellowes.*)

Life of Comenius, with his Essay on the Education of Youth. (*Mallalieu.*)

Memoir of Bernard Overberg. (*Seeleys.*)

HISTORY OF EDUCATION.

*Von Raumer's Geschichte der Pädagogik. 4 vols. (Stuttgart.)

Carl Schmidt's Geschichte der Pädagogik. 4 vols.

——————— Geschichte der Erziehung und des Unterrichts. (Cöthen.)

Fritz's Esquisse d'un Système complet d'Instruction et d'Education, et de leur histoire. 3 vols, (Strassburg.)

Schmid's Encyclopädie des Erziehungs- und Unterrichtswesens.

Hergang's Pädagogische Real-Encyclopädie.

[We have no works in English corresponding to the above, nor any translation of them.]

MISCELLANEOUS.

Wiese's German Letters on English Education. Translated by W. D. Arnold. (*Longmans.*)

*Pestalozzi's Leonard and Gertrude. 2 vols, (*Mawman,*)

Dr. Paris's Philosophy in Sport made Science in Earnest. (*Murray.*)

*Miss Edgeworth's Harry and Lucy concluded. (*Simpkin.*)

Cousin's Report on the State of Public Instruction in Prussia. Translated by Mrs. Austen. (*Effingham Wilson,*)

Whewell on University Education. (*Parker.*)

Sedgwick on the Studies of Cambridge. (*Parker.*)

George Combe on the Constitution of Man. (*Simpkin,*)

J. S. Mill's Inaugural Lecture at the University of St. Andrews. (*Longmans.*)

The Prefaces to Professor De Morgan's Treatises on Mathematics, especially Algebra. (*Taylor and Walton.*)

Quarterly Journal of Education. 10 vols. (*Knight.*)

The Museum. 8 vols, (*Nelson.*)

Educational Times, containing reports of all the Lectures delivered at the College of Preceptors, especially those published by order of the Council:—(1.) On the Science and Art of Education and Educational Methods, by Joseph Payne; (2) On the Teaching of English, by the Rev. E. A. Abbott; (3) Classics, by the Rev. Dr. Jacob; (4) Physics, by Professor Carey Foster; (5) Mechanics, by Professor Adams; (6) Botany and Geology, by J. M. Wilson.

Principles of Education, especially that of Women, by M. A. Stodart. (*Seeleys.*)

Thoughts on Self-Culture, addressed to Women, by Maria G. Grey and her sister Emily Shirreff. (*Parker.*)

*Intellectual Education, by Emily Shirreff. (*Parker.*)

*The Education of Girls, by Professor W. B. Hodgson. (*Trübner.*)

*The Higher Education of Women, by Emily Davies. (*Strahan.*)

A Visit to some American Schools and Colleges, by Sophia Jex Blake. (*Macmillan.*)

PRINCIPLES

OF THE

SCIENCE OF EDUCATION.

AS EXHIBITED IN THE PHENOMENA ATTENDANT ON THE UNFOLDING OF A YOUNG CHILD'S POWERS UNDER THE INFLUENCE OF NATURAL CIRCUMSTANCES.

[Printed for the use of the Members of Professor Payne's Class at the
College of Preceptors.]

[The education considered in this paper is mainly that of the Intellect; Will and Feeling being assumed, and not specially treated.

The objects aimed at are, to show—(1) That the development of a child's powers under the influence of external circumstances constitutes his natural education; (2) that formal education under the professed teacher is to continue and supplement natural education, and *mutatis mutandis*, to recognise and adopt the same agencies, processes, and means; and therefore (3) that the Art of Education or Teaching, in general, is the practical application of the principles of natural education.]

PRINCIPLES

OF

THE SCIENCE OF EDUCATION.

I. GENERAL PRINCIPLES.

The child an organism.

1. Every child is an organism, furnished by the Creator with inherent capabilities of action, and surrounded by material objects which serve as stimulants to action.

Agency of the sensory organs.

2. The channels of communication between the external stimulants and the child's inherent capabilities of action are the sensory organs, by whose agency he receives impressions.

Sensations the elements of knowledge.

3. These impressions, or sensations, being incapable of resolution into anything simpler than themselves, are the fundamental elements of all knowledge. The development of the mind begins with the reception of sensations.

Sensations grow into ideas.

4. The grouping of sensations forms perceptions, which are registered in the mind as conceptions or ideas.* The development of the mind, which begins with the reception of sensations, is carried onward by the formation of ideas.

Natural education.

5. The action and reaction between the external stimulants and the mind's inherent powers, involving processes of development† and implying growth, may be regarded as constituting a system of natural education.

What is involved in a system of education.

6. A system of education implies—(1) an educating influence, or educator; (2) a being to be educated, or learner; (3) matter for the exercise of the learner's powers; (4) a method by which the action of these powers is elicited; and (5) an end to be accomplished

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* By "conception," or "idea," is meant the trace, residuum, or ideal substitute which represents the real perception.

† The term "development" is here employed for that unfolding of the natural powers of which "growth" is the registered result.

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7. In the case before us, the educating influence, or educator, is God, represented by Nature, or natural circumstances; the being to be educated, or learner, a child; the matter, the objects and phenomena of the external world; the method, the processes by which this matter is brought into communication with the learner's mind; and the object or end in view, intellectual development and growth.

In view of the different agencies concerned in effecting this intellectual education, and of their mutual relation, we arrive at the following:—

II. PRINCIPLES OF NATURAL EDUCATION.

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I. Nature, as an educator, recognises throughout all his operations the inherent capabilities of the learner. The laws of the learner's being govern the educator's action, and determine what he does, and what he leaves undone. He ascertains, as it were, from the child himself how to conduct his education.

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II. The natural educator is the prime mover and director of the action and exercise in which the learner's education consists.

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III. The natural educator moves the learner's mind to action by exciting his interest in the new, the wonderful, the beautiful; and maintains this action through the pleasure felt by the learner in the simple exercise of his own powers—the pleasure of developing and growing by means of acts of observing, experimenting, discovering, inventing, performed by himself—of being his own teacher.

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IV. The natural educator limits himself to supplying materials suitable for the exercise of the learner's powers, stimulating these powers to action, and maintaining their action. He co-operates with, but does not supersede, this action.

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V. The intellectual action and exercise in which the learner's education essentially consists are performed by himself alone. It is what he does himself, not what is done for him, that educates him.

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VI. The child is therefore a learner who educates himself under the stimulus and direction of the natural educator.

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rience.

VII. The learner educates himself by his personal experience; that is, by the direct contact of his mind at first with the matter—object or fact—to be learned.

VIII. The mind, in gaining knowledge for itself, proceeds from the concrete to the abstract, from particular facts to general facts, or principles; and from principles to laws, rules, and definitions; and not in the inverse order.

The mind proceeds from the concrete to the abstract.

IX. The mind, in gaining knowledge for itself, proceeds from the indefinite to the definite, from the compound to the simple, from complex aggregates to their component parts, from the component parts to their constituent elements—by the method of Investigation. It employs both Analysis and Synthesis in close connection.

The mind proceeds by the method of Investigation.

X. The learner's process of self-education is conditioned by certain laws of intellectual action. These are—(1) the Law of Consciousness; (2) of Attention, including that of Individuation, or singling out; (3) of Relativity, including those of Discrimination and Similarity; (4) of Retentiveness, including those of Memory and Recollection; (5) of Association or Grouping; (6) of Reiteration, or Repetition, including that of Habit.

The laws of intellectual action.

XI. Memory is the result of attention, and attention is the concentration of all the powers of the mind on the matter to be learned. The art of memory is the art of paying attention.

Memory the result of attention.

XII. Ideas gained by personal experience are subjected by the mind to certain processes of elaboration; as, classification, abstraction, generalisation, judgment, and reasoning. These processes imply the possession of ideas gained by personal experience, and they are all performed by the youngest child who possesses ideas.

Processes of mental elaboration.

XIII. The learner's knowledge consists in *ideas*, gained from objects and facts by his own powers, and consciously possessed—not in *words*. The natural educator, by his action and influence, secures the learner's possession of clear and definite primary ideas. Such ideas, so gained, are necessarily incorporated with the organic life of the learner's mind, and become a permanent part of his being.

Knowledge consists in ideas, not in words.

XIV. Words are the conventional signs, the objective representatives, of ideas, and their value to the learner depends on his previous possession of the ideas they represent. The words, without the ideas, are not knowledge to him.

Words without ideas are not knowledge to the child.

XV. Personal experience is the condition of development, whether of the body, mind, or moral sense. What the child does himself, and loves to do, forms his habit of doing; but the natural educator, by developing his powers and promoting

The growth of body, mind, and conscience the result of self-education.

their exercise, also guides him to the formation of right habits. He therefore encourages the physical development which makes the child healthy and robust, the intellectual development which makes him thoughtful and reasonable, and the moral development which makes him capable of appreciating the beautiful and the good. This threefold development of the child's powers tends to the formation of his bodily, mental, and moral character, and prepares him to recognise the claims of religion.

Definition of education.

XVI. Education as a whole consists of development and training, and may therefore be defined as "the cultivation of all the native powers of the child, by exercising them in accordance with the laws of his being with a view to development and growth."

These principles constitute the Science of Natural Education.

The above general facts or principles being the results of an analytical investigation into the nature of the child as a thinking being, and into the processes by which his earliest education is carried on, constitute the Science of Natural Education.

Natural Education the model of Formal Education.

But as it is the same mind which is to be cultivated throughout, Natural Education is the pattern or model of Formal Education, and consequently the Science of Natural Education is the Science of Education in general.

The formal educator must therefore recognise that in his practice.

The formal educator or teacher, therefore, who professes to take up and continue the education begun by Nature, is to found his scheme of action upon the above principles, and in supplementing and complementing the natural educator's work he is to proceed on the same lines. He is not to intrude modes of action which contravene and neutralise the principles of natural education.

III. THE ART OF EDUCATION.

Art the application of Science.

1. Art is the application of the laws of Science to a given subject under given circumstances.

Art the explicit display of the implicit principles of Science.

2. The Art of Education, or Teaching, is the explicit display of the implicit principles of the Science of Education.

The child a learner who teaches himself.

3. The principles already stated set the child or pupil before us as one who gains knowledge for himself, at first hand, by the exercise of his own native powers, through personal experience, and therefore as a learner who teaches himself.

This central principle a limit.

4. This is the central principle of the Art of Teaching. It serves as a limit to define both the functions of the formal teacher, and the nature of the matter on which the learner's powers are first to be exercised—that is, of the subject of instruction.

It limits or defines the function of the educator.

5. The limit which includes also excludes—it proscribes as well as prescribes. The teacher who regards the child as a learner who is to teach himself through personal experience, is therefore interdicted from doing anything to interfere with the learner's own method,—from telling, cramming, explaining, and even from correcting, merely on his own authority, the learner's blunders. The function assigned him by the Science of Education is that of a stimulator, director, and superintendent of the learner's work, and to that office he is to confine himself.

It also determines the nature of the matter to be learnt.

6. But the limit in question determines also the character of the matter on which the learner's powers are to be first exercised. If he is to teach himself, he can only do so by exercising his mind on concrete objects or actions—on facts. These furnish him with ideas. He cannot teach himself by abstractions, rules, and definitions, packed up for him in words by others; for these do not furnish him with ideas of his own. In all that he has to learn he must begin with facts—that is, with personal experience. It is clear, then, that the conception of the learner as a self-teacher determines both the manner in which he is to be taught and the means.

The general principle applies both to education and direct instruction.

7. This notion of the Art of Teaching, which has specially in view the period of the child's life when the formal teacher first takes him in hand, in order to develop and train his mind, is capable of general application. It applies, therefore, with the requisite modifications, to instruction properly so called, which consists in the orderly and systematic building of knowledge into the mind, with a definite object.

The teacher educates by instructing, and instructs by educating.

8. The teacher, therefore, educates by instructing, and instructs by educating. Education and instruction are different aspects of the same process.

Summary.

9. The sum of what has been laid down is, that the Art of Education consists in the practical application of principles gained by studying the nature of the child; the central principle, which governs all the rest, being that it is what the child does for and by himself that educates him.

THE

TRAINING AND EQUIPMENT

OF THE

TEACHER FOR HIS PROFESSION.

AN EXAMINATION OF CERTAIN VIEWS ON THIS SUBJECT ADVOCATED AT THE RECENT CONFERENCE HELD TO DISCUSS THE REPORT OF THE SCHOOLS INQUIRY COMMISSION.

[*Read at the Evening Meeting of the College of Preceptors, April* 14, 1869.]

"Le peuple qui a les meilleures écoles est le premier peuple."—*Jules Simon.*

"Boys learn but little here below,
And learn that little ill."
Goldsmith altered by Mr. Gladstone.

"In no department of human activity [as in English Teaching] is there such a pretentious display of power with such a beggarly account of results."—*Professor Blackie.*

THE

TRAINING AND EQUIPMENT OF THE TEACHER FOR HIS PROFESSION.

AMONG the various topics which presented themselves for discussion at the Conference held on the 7th of January, there was one which pre-eminently occupied the attention of the meeting. It was that of the teaching of the teacher: the question, that is, whether any special preparation was needed to fit him for his work; and if so, what should be its character and extent? Among the teachers who took part in the discussion, there appeared to be many who were directly opposed even to the idea of such a training; while others, sympathising generally with the object, expressed great doubts respecting the possibility of attaining it. Indeed, there was anything but unanimity on the question. As, however, one more deeply affecting the interests of education can scarcely, as I venture to think, be entertained, it has seemed to me and to others that it ought not to be left in its present condition; and hence the occasion of my presenting myself here this evening.

The reason why the teaching of the teacher—his complete equipment for his work—is so exceedingly important, is, that the work he has individually and personally to do is so important. The external machinery of education—its schoolroom, and forms, and books—has of course its value; but, after all, it is nothing but machinery, utterly destitute in itself of automatic power. It is dead, and indeed useless, until the teacher's vital influence pervades it. He is the very soul of the whole apparatus of means, and indeed the only positively indispensable element in it. Hence it is found that the quantity of force generated by a given system of educational means and agencies is, to speak technically, as the teacher's knowledge, virtue, and intelligence—not as the external machinery. In other words, while the teacher may in a great degree dispense with the apparatus, the apparatus can in no degree dispense with him. This vital connection between the teacher and his work renders the one, in a certain respect, the measure of the other. Given the qualifications of the master, his conscientiousness, zeal, knowledge, and experience, we can with tolerable accuracy predict what his school will be—and, on the other hand, given the school, we can in a great degree resolve its character into that of the master. This general conviction of the intimate, even indissoluble, connection between the teacher and his work, is expressed in the popular adage, "As is the teacher—*not*, as is the external machinery—so is the school"—which of course is convertible into the equivalent proposition, "As is the school, so is the teacher;" or, in other words, the school is what the master makes it. So far as this proposition is tenable, it means, of course, that the condition of any given school is the test or gauge of the master's efficiency. If that condition is unsatisfactory, then the teacher is unsatisfactory; if good, the teacher's energy, devotion, and skill deserve the credit. But, whether good or bad, the teacher must bear the responsibility. This remark, as well as others I may have to make of the same tenor, must be interpreted as having a general application. There may be cases—there probably are—in which the circumstances are so exceptional, and the difficulties of such a character, that the teacher cannot fairly be made responsible for the result. These exceptions do not, however, vitiate the general conclusion, that the teacher, not the machinery with which he works, or the tools he handles, must be tested by the rule above laid down, "As is the teacher, so is the school." That conclusion, then, which may not be true when drawn from a special case, must be absolutely true when the number of cases is sufficiently large to enable us to arrive at a fair average. In a general review of a very large number of cases, the particular exceptions must be estimated on their own separate account, and allowed for accordingly; but their individual merit or demerit cannot be regarded as vitiating the general conclusion. If, then, we enlarge the field of observation so as to embrace all the schools of any particular nation, we have a right to say that the results of its formal education are the index or measure of the efficiency of its teaching. Applying this argument to the case of England, for instance—if we find a thoroughly well instructed and educated people, we ought to conclude that the training which has made them so is satisfactory; and, therefore, that the teachers who have conducted the training must have been thoroughly competent in all respects. They must have been men of high intelligence to begin with; they must have been extremely well instructed in the subjects they have taught; they must have employed the best methods, and they must have been conscientious, painstaking, zealous, and industrious. If, on the other hand, it should be found that we are not a generally well instructed and educated people—and no one that examines into the facts, or even trusts to common observation, will maintain that we are—then, by the argument I have adopted, we are compelled to make the teachers of England generally responsible for the failure. English pupils, as a rule, are capable of instruction, they are not more stupid and impracticable than those of other nations; the external machinery of education in our universities, colleges, and schools, whether of secondary or primary instruction, is not singularly deficient in quantity or quality; funds for working that machinery are in general adequately supplied; and yet, in spite of all this costly apparatus, in spite of the assumed sufficient abilities of the pupils, the results are most unsatisfactory. The various commissions which have been appointed of late years to inquire into our different kinds of education—from the Universities down to the dame-schools—have told us what these results are; and, in doing so, have pronounced a verdict of "failure" on them all.*

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* *Universities and Public Schools.* The testimony of several distinguished public tutors and examiners of Oxford and Cambridge is (as shown in the Report on Public Schools) that *the average of youths entering the Universities from Public Schools* are "badly grounded,"—are, "in knowledge, absolute ignoramuses,"—"have everything to learn, and little desire to learn anything,"—"have few intellectual tastes,"—have "very unawakened minds, and habits of mental indolence and inaccuracy,"—require "their shortcomings to be supplemented" by the University teaching, which is therefore "hampered" by interference with its own proper work,—evince "surprising ignorance" on points not strictly academical,—are "deplorably ignorant of English literature, English history, and English composition,"—"*read* worse than the majority of pupil teachers in elementary schools," and often spell notoriously ill.

Lord Clarendon, too, spoke severely, during the examination of Dr. Balston, of everything in the way of general knowledge being given up at Eton in order that Classics might have all the time, and yet that boys went up to Oxford, "not only not proficient, but in a lamentable state of deficiency with respect to the Classics." Mr. Gladstone, moreover, testifies that "the amount of work which we get out of the boys at our public schools, speaking of the mass of them, is scandalously small."

These quotations have a significance in two directions. They indicate the necessary failure of the University course for which such results are a preparation; and, by the argument *à fortiori*, they measure the quality of middle-class teaching, inasmuch as it is assumed, and indeed was not long ago asserted by the Bishop of Oxford, that the teaching of the public schools is the best that can be found.

Middle-Class Schools. See Chap. II. of the Schools Inquiry Commission's Report, *passim;* and also Dr. Gull's, Dr. Aclands, and Mr. Paget's evidence.

The working of the machinery in each of the four great departments of instruction has been proved to be immensely below its theoretical power. It would be quite impossible, within the narrow limits of one lecture, to enter on a formal proof of this assertion, nor is it necessary for my present purpose to attempt it. I can only refer those who have any doubts on the subject to the admirable Reports of the Commissioners, and the evidence on which they are founded—the evidence being often more truly instructive than the Reports themselves—to the testimony of foreign reporters on the same subject, and to general experience and observation—all of which, with a combined force which is irresistible, support the general proposition, that in our Universities, Public Schools, Middle-class and elementary schools, the general results of our teaching are deplorable.* Leaving, however, out of consideration three out of these four main departments of instruction, I will confine myself to that of middle-class education, concerning which the opinion of those who are competent to form one is all but unanimous. With one voice, then, competent judges—educated men, politicians, and philanthropists—declare that the middle classes of England do not generally get a good education in any sense of the term. We all know—English society everywhere knows—that the great bulk of the men about us—pupils of the system—are not cultivated, are indeed indifferent to cultivation, are unacquainted with the fundamental principles of literature and science, do not read works requiring thought and study, despise those who do, are in fact unpermeated by the "sweetness and light" on which Mr. Matthew Arnold has discoursed so pleasantly. These men are, however, the living result of middle-class education. Can they have received a really good education, who, for the most part, do not appreciate education, who not unfrequently treat both the educator and his work with half-concealed contempt? Without, however, dwelling longer on general statements, every one of which may no doubt be opposed by the citation of special exceptions—which, however, do not, as I have shown before, affect the average—I will quote here a passage from the *Athenæum* of March 27 last, which well deserves to be read, marked, learned, and inwardly digested, both by teachers and the public. It is this:—"A petition was last week presented to the House of Commons from the Council of Medical Education, stating that the maintenance of a sufficient medical education is very difficult, owing to the defective education given in middle-class schools. A similar complaint was made in a petition from the British Medical Association, numbering 4000 members. In a third petition, proceeding from the University of London, it was stated, that during the last ten years 40 per cent. of the candidates at the Matriculation examinations have failed to satisfy the examiners." Now, what reply can be made to a statement like this? Will it still be maintained that the view that I have taken of the general results of middle-class traching is erroneous? But if the test already adduced—"As is the teacher, so is the school"—is worth anything, we must surely apply it here. If the education of middle-class schools is so defective that it cannot be employed as the basis on which to found the scientific education necessary for the medical profession, on whom can the blame be cast? Who are responsible for the results of middle-class education but middle-class teachers? If they all entered on their work, equipped with accurate knowledge, cultivated intelligence, trained skill in teaching, and a high appreciation of the grave importance of their functions, could such a complaint as the above be possible?

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* ***Primary Schools.*** See a Letter in the *Times*, July 15, 1867, by Canon Gover, whose statistics supply evidence that 94 *out of every* 100 of the people are furnished with an educational equipment which consists only of the barest rudiments of instruction; so bare indeed, as to be almost useless. See a discussion of this point in an article on "Eton" by the lecturer, in the "British Quarterly Review" for Jan. 1868.

But though the teachers must be charged with being the *proximate* cause of the failure of our education, it may justly be remarked that they are themselves, to a large extent—not large enough, however, to acquit them of their own obligations—the effect of another cause, to which I will briefly call your attention. That cause is the profound indifference of the public mind to the value and power of education. This indifference is itself an effect, as well as a cause, of the state of things in question. It is first an effect or product of the unsatisfactory teaching complained of. The public mind has been positively disqualified for fairly estimating anything better by having been persistently drilled and indoctrinated in what is proved to be bad. As well may you expect a blind man to take delight in pleasant sights, and a deaf man in pleasant sounds, as an uneducated public mind to appreciate culture. It does not know what you mean, when you urge the claims of education as a civilizing agent, and insist upon the immense value to the commonwealth of the accomplished teacher. It scarcely comprehends the idea of an accomplished teacher, as distinguished from that of any other man, accomplished or not, who calls himself by the same name. Hence that very indifference and apathy, which is the *result* of inefficient teaching, becomes in its turn a cause, and a very powerful one too, of the maintenance of things as they are. But this general indifference as to the quality of education leads, by an easy step, to a non-appreciation of the profession of the educator. Society has taken note of the fact, that hitherto the members of that profession have shown little anxiety or care that those who enter it should be well qualified men; have indeed practically acquiesced in the assumption that any man could declare himself a teacher, and has therefore taken the teacher at his own low estimate of himself, and treated him accordingly. There cannot be a clearer proof of the general truth of this observation than the fact that the governments of our country, whether Liberal or Conservative, have, without any exception that I am aware of, treated with contemptuous indifference the notion that educators, as such, however highly qualified by knowledge of the theory, and by dearly bought experience in the practice of their profession, have any special authority in the discussion of educational matters. Their opinions and advice, if listened to at all, are placed on exactly the same footing as those of persons having neither their knowledge nor their experience; and the world has seen with wonder commissions on education, appointed one after another, from which, as if by preconcerted ingenuity, the names of practical schoolmasters and of educators by profession have been carefully excluded.* What a pregnant commentary on the popular estimate of the value of education in this country! Imagine the parallel case of commissions on engineering, architecture, medicine, law, or church matters, appointed to investigate the actual condition of these faculties, to ascertain the causes of their failure in certain respects, and to devise measures for their improvement, in which the names of the most eminent engineers, architects, physicians, lawyers, and divines should be conspicuous only by their absence. In thus acting, the governments in question have, it is true, only, as they were well aware, reflected the popular estimate of the real value of the educator: but then, what must have been the image which could be thus reflected? The same thing will be done again in the constitution of the new Educational Council, under Mr. Forster's Bill, if the schoolmasters of England are weak enough to permit it. If there were, indeed, a profession of teaching, united by the common interests of education, instead of a merely mechanical aggregation of jarring and even opposing elements, which assumes the name without any of the power of a united body, education would certainly be represented in the Educational Council. As things are, there is anything but a certainty that it will. When, however, it shall be brought about that accomplished teachers are known to be men possessed of knowledge of a special kind, and furnished with credentials of unquestionable authority, which distinguish them from those who, as things now are, without special qualifications of any kind, not even genuine interest in their work, assume, but do not dignify, the honourable name of educator which they bear, we shall be advancing on the road which will at last lead to the establishment of the profession of education. We are, however, far enough from that consummation at present. Additional instances might easily be quoted to illustrate the general proposition, that public opinion in England does not appreciate the teacher or his work; but the illustrations I have given must for the present suffice,—especially as I have still to bring forward another aspect of the subject very intimately connected with the end I have in view. I am fully prepared for the opposition which the statements I am about to make will excite in the minds of some teachers; but it would betoken an abject and craven spirit in me to withhold them on that account, conscious as I am that I have no interest but theirs at heart. I therefore venture to affirm that the great body of teachers are themselves responsible for the popular estimate which has been formed of their profession. We all remember the pregnant words which tell us that in certain circumstances "a man's enemies are the men of his own house." I cannot but think that these words are strictly applicable to the case before us. Surely there is no injustice in saying that those teachers who express themselves as "satisfied" with the present miserable condition of education amongst us,—who deride every attempt made to prepare the teacher for his work as unnecessary and absurd,—who characterise discussions on methods of teaching as "stuff,"—who stigmatise the science of education as "quackery,"—are among the direst enemies to the cause of education.

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* The single exception is Dr. Temple, who was appointed on the Schools Inquiry Commission.

If time permitted I would refer to many conclusive evidences of the truth of my position, that English teachers in general take but little concern in education for its own sake. I must, however, mention, as briefly as I can, one or two. How is it, I would inquire, if my views on this point are wrong, that it has never been possible in England to establish a journal of education? The attempt has frequently been made, but has never succeeded, while such journals may be counted by dozens in Germany and America, and are numerous in France and Switzerland? Does this fact show much interest in education on the part of English teachers? How is it, again, that lectures on methods of teaching, delivered in this very room by men of great knowledge and experience, open to teachers without cost, are attended by an average of half-a-dozen teachers out of the hundreds of London? How is it that this College of Preceptors, disinterestedly founded by men whose sole aim was the advancement of the interests of Education, has been, and is, comparatively feebly supported? And finally, how is it that works on Education, both as an art and as a science, which are produced in numbers in Germany and America to supply a recognised want, are here invariably published at a loss to the author? Are these instances, which might easily be multiplied, proofs of interest in the cause of Education, or of indifference to it? I pause not for a reply, but proceed to inquire how it happens, if the training of the teacher is a matter of so little concern in England, that nations quite as competent as we are to estimate the value of such training, come to so entirely different a conclusion? Are we to impugn the intelligence—nay, even the common sense—of France and Germany, for instance, in taking so much pains to accomplish an object which we in England regard with supreme indifference, if not with contempt and disgust? Is there anything in our climate, national habits, or natural endowments, which warrants us in dispensing with a machinery of means which has accomplished so much for Frenchmen and Germans?

I do not suppose that anybody really acquainted with the subject will attempt to reply to these questions affirmatively, and, in doing so, confront either the actual persons, or the spirit which still lives in their works, of such men as Silvestre de Sacy, Royer-Collard, Georges Cuvier, Poisson, Victor Cousin, Guizot, Vatismenil, Fortoul, Prévost Paradol, Jules Simon, Michelet, and the present accomplished Minister of Instruction, M. Duruy, all of whom have been either constructors or products of the training system of France, and an equal, if not superior, array of distinguished men in Germany, whose names I have no time to quote. Pupils of the Ecole Normale, too, whose first year's course in Mathematics, for instance, requires a good knowledge of the differential and integral calculus, with an equivalent advance in other studies, and German students of pædagogy, who, on leaving school, and before beginning their special course, have passed a far harder examination than that appointed for graduates in our Universities—even these pupils, to say nothing of their masters, might possibly be found rather formidable antagonists. But I am reminded that a veritable authority in education, a practical teacher of considerable eminence, I mean Dr. Benson of Wellington College, has personally inquired into the German system of teacher-training, and has pronounced against it. A letter from him, you will remember, was quoted by Mr. Walter in the course of the discussion on Mr. Forster's Bill, and it may, perhaps, relieve the tedium of my arguments and illustrations if we direct our attention, for a few minutes, to its contents. It contained a statement of facts, as well as certain opinions founded on Dr. Benson's own experience. Its statement was, that Dr. Benson, being once at Berlin, was present at the trial lesson of a young candidate for the *facultas docendi*, or final diploma in education, given at an advanced Gymnasium of that city. It appears from the account, that the juvenile doctor, for he was already a high graduate—perhaps fluttered somewhat by the presence of the English doctor, who was keenly looking after him—"did very badly," but nevertheless got a first-class certificate. Dr. Benson, being grieved at the occurrence, spoke to the professor in charge about it. That gentleman, evidently much fluttered too, got out of the embarrassment into which our doctor had forced him as well as he could, muttered something about the test being necessarily formal, and ended by saying that it would be better dispensed with. The story would, perhaps, be more to the point if we knew how far Dr. Benson's knowledge of German enabled him to judge of the candidate's failure; as, after all, it *is* conceivable that he did not do "very badly," even though Dr. Benson fancied that he did. Again, the expression, "he did very badly," is very vague. Was it ignorance of the subject of the lesson, or want of nerve, or positive incompetency in handling the class as a whole? On these points we remain uninformed. However, *valeat quantum*—one example proves nothing against a comprehensive system. Would Dr. Benson like the Wellington College system of education to be decided on by a German professor, from the exhibition made by one boy at one examination? If Dr. Benson had kept silence on this subject we might have credited him with the possession of many stronger facts against the German system than this which he has brought forward. Those who consider it decisive against the system are of course at liberty to think so; but those who know how numerous are the tests to which the pupil teacher in Germany is subjected throughout the whole course of his three years' training, will not be of that opinion. But while Dr. Benson is in the box I will take the liberty of examining him a little in his turn on another part of his letter. He is a strenuous witness in the case of Chaos *versus* Kosmos, and we will venture to ask him a few questions. He wishes to show that an examination on paper—an explanation of actions in words—does not supersede the experience which is to be gained by the actions themselves—as if any one ever pretended that it did; and he goes on to tell us that the weakest master he ever knew was a man who would have been able to give on paper the best description of the means by which the difficulties of managing a form of boys were to be met; whereas, in presence of the actual difficulties themselves, his knowledge of theory would have failed to give to him any aid; and therefore, argues Dr. Benson, it is of no use to attempt to prepare teachers for the work they undertake. We may fairly inquire, however, whether this weakest of teachers would have been any stronger without the theoretical knowledge than he was with it; and whether if, in addition to this knowledge, he had been thoroughly practised in witnessing how other teachers overcame similar difficulties—for that is an essential part of the German system—he might not have been better prepared to meet the difficulties which confronted him in his own experience. Here, too, we want to know all the circumstances of the case before we can implicitly receive Dr. Benson's evidently prejudiced testimony. But he goes on to assure us that "only experience can prove whether a man can teach or not"—and that "probably a period of not less than two years would be required to ascertain this point;" and therefore—for this is the gist of the argument—that any attempt to shorten the period of trial for himself and his pupils (who by the hypothesis must all the time be very much *tried* too) is useless, and indeed absurd. This argument has, I believe, some weight with opponents of training. Let us consider it for a moment. Stripped of useless words it amounts to this, that as you cannot learn to swim before you go into the water, all exercises or training which assume that you can is of the essence of quackery. I do not deny that there is some truth mingled with the error which pervades this argument. It is true enough that you cannot by any preconcerted arrangements or contrivances anticipate all the practical lessons of life; but then this only means that you cannot live to-morrow until to-morrow comes. Is this truism generally admitted as a reason for utterly neglecting to prepare children for the business of life? Because it is true that in one sense we can only learn to live by living, do we allow our children to grow up in perfect ignorance of what is before them? Surely there is some fallacy in this treatment of the question, which obviously assumes that those who, like the French, Germans, and some Englishmen, insist on the value of training, deny the value of experience altogether. Those who take this ground forget that the opportunity for experience is a common factor which stands on both sides of the equation. The trained and the untrained teacher must alike learn the lessons of experience; but to which of the two, I would ask, are those lessons likely to prove most valuable? If the previous training practically abridged the period of probation by one-half or three-fourths, as it probably would, is this no gain to the teacher himself, and especially to his pupils, who all the time that their teacher is teaching himself at their expense, are manifestly, to some extent, defrauded of the instruction which is their due? Supposing, however—and it is a supposition which may possibly be very near the truth—that on the average, the masters of Wellington College, or any similar institution, do not stay there even so long as two years, are we to congratulate the Head Master on the cleverness of the arrangement which places his pupils under a constant succession of raw recruits? Is this really the best possible way of supplying our colleges and schools with superior masters? We decline, however, on the whole, to accept either Dr. Benson's facts or his arguments as decisive against the judgment and experience of the eminent men of France and Germany, who, honouring the profession of the teacher, and having regard to the importance of his functions to the commonwealth, have concerted an admirable machinery of means, on which no pains nor expense is spared, for equipping him worthily for his career. I can only very briefly refer to the machinery devised for accomplishing this purpose. In France, the École Normale Supérieure is destined to the training of the highest professors and public teachers; but there are many other Normal Schools for candidates of lower pretensions. In the former, the pupil must pass an entrance competitive examination, under the stringency of which most of our University passmen would certainly succumb—and, indeed, they must be Bachelors in Arts or Science before they can compete at all. The successful candidate is then for three years carried through courses of either literature or science, at his choice; and, during the last year especially, is required to attend lectures on pedagogy, including "method," and to visit daily the superior *lycées* of Paris, to observe and take notes of the routine of teaching, and to teach occasionally himself. He is finally examined on the subjects which he has been studying, and required to give lessons, as if to a class, in several of them, in the presence of competent judges of teaching. The result is thus concisely stated in the Schools Inquiry Commission Report:—"The Normal School at Paris is the pivot of their whole machinery. Filled by open competition with the pick of the French youth, officered by the very best professors that can be found, it annually supplies the French schools with teachers not surpassed in the world" (p. 612). This is one of the systems of teacher-supply which is to be set against our own raw-recruit system. But I turn for a moment to Germany, where the object in view is not less highly estimated, nor the means for securing it, though quite different, less stringent. There is no École Normale Supérieure in Germany, but the career of instruction and training for the teacher is equally defined and prescribed. The German authorities are quite as firmly resolved as those of France, to be assured that the man who proposes to undertake the functions of a teacher shall be as thoroughly prepared for his career as human ingenuity and forethought can made him. The severest tests are therefore applied to ascertain, in the first place, his knowledge of the subjects which he will have to teach. In the next place, he has to attend lectures on the principles and practice of the art of teaching; thirdly, he has to show his fitness for teaching by repeatedly teaching in the presence of experts appointed to hear him, from whom he receives a certificate graduated according to his success in passing these tests; and lastly, he is required, after his course of special instruction is over, to pass a year, as a probationer, at some approved school, sometimes of a higher class than that which he is himself preparing for, in order that he may know what the higher instruction is. During this last year he is directed to watch the work of the school, learn how it is done, and occasionally, by way of practice, take a share in it. After all this elaborate course of preparation, he gains his certificate—his unconditional *facultas docendi*, or leave to teach. Here again, if our raw-recruit system is compared with that of cultivated Germany, what must be in the mind of any rational investigator the inevitable result? Is there not a necessary connection between cause and effect—and can any one now seriously dispute my main position, that, the teacher and the school being criteria or measures the one of the other, teachers who have been trained according to either of the above systems must be better qualified than those not trained at all? Is it not *à priori* probable that the work they have to do will be more satisfactory? If it were not it would argue a remarkable degree of stolidity in the devisers of the machinery, and in the teachers who are the results of it. No one, however, who really examines into the facts, can doubt that improved results in the pupils invariably follow improvement in the preparation of the teacher;—and hence I am compelled to reassert the proposition, that the results of teaching bear a direct ratio to the virtue, intelligence, knowledge, and skill of the teacher; that if we take no pains to secure the possession of these qualifications in the teacher, we have no right to expect the fruits of them in the pupils; and, finally, to maintain that the present condition of middle-class education amongst us, unsatisfactory as by universal consent it is, is in a great measure the consequence of the insufficient training of the teachers. It will have been observed that many of the arguments of my opponents—if I must thus designate them—have been casually dealt with in the course of my paper. I propose now to grapple rather more closely with them, and with some others which were brought forward at the recent Conference. There were three classes of opponents of the views which I and some others took of the importance of training the teacher.

1. Those who advocated entire free trade in education, checked by nothing but public opinion.

2. Those who would require no test whatever from a teacher when he entered on his career, but would subject his work from time to time to authoritative examination.

3. Those who would impose an intellectual test, and nothing more, on entrance, and admit an examination of results.

The advocates of these three several views, while differing widely from each other, agreed in denouncing the notion—as Dr. Benson also denounces it—that there is any such thing as an art of education; that is, they denied the utility of training teachers under competent direction for their profession, as you train engineers or architects for theirs. In this denial was involved the counter-assertion that all methods of teaching are practically on the same footing, that there is no such thing as a good, in distinction from a bad, method; and the further assertion, or implication if you will, that a teacher's instinct is to be left to adopt the one or reject the other. No one, I think, who listened here the other evening to Mr. Meiklejohn's admirable lecture, "On the Best and Worst Methods of Teaching Geography," went away impressed with that opinion.

They were, on the contrary, impressed with the notion—which is, I confess, my own—that, as the bad methods happen to form the rule and the good ones the exception, neither instinct, nor uninstructed routine, is a good guide in the matter. Neither instinct nor routine gives us the slightest guarantee against the perpetuation of the worst methods, nor any encouragement for the adoption of the best. But there was one gentleman who went still further, and earnestly "hoped" that we might have "none of the quackery of pedagogy"—by which he meant, as I suppose, to depreciate both "method" and principles of teaching together. Of course, it is easy to make sport of a name,—and as it happens, pedagogy is not a pretty one,—but as "a rose by any other name would smell as sweet," it is, after all, the thing rather than the name that is in question. Let us call it, as Professor Pillans did, Paideutics or Didactics, and say in a few words what it means. The practice of teaching, like that of every other art, must be founded on principles which account both for what it does and for what it leaves undone; for its success under one arrangement, for its failure under another. It is evident enough that in this art, as in others, a man does acts every one of which, however trivial, may require for its explanation very profound investigations. Now, the man instructed in the practice simply, may perform these acts perfectly, as a mere routineer, without knowing anything of the theory which explains them; but it must be allowed that the man who merely knows the *how* does not stand so high as he who also knows the *why*. The one merely works for results, the other investigates causes. The former is, in the strict sense of the term, instructed; the latter is educated. Paideutics, then, includes both the practice and the principles of education; and why this knowledge, which embraces, of course, the sciences of mental and moral philosophy, as well as physical training, should be regarded as ridiculous, I am at a loss to conceive.

Having touched upon the common point of agreement between my opponents,—their repudiation of Paideutics,—I come to consider the first special point: the theory of free trade in education. This theory was thus propounded by one of the speakers at the Conference. He would allow "any one to set up for a schoolmaster who chose to fancy he had the ability, leaving it to the public to decide whether or not he was fit to follow the profession." This is indeed free trade *pur et simple*. Every one is to offer his wares, and it is the buyer's business to see that he is not cheated in the bargain. There is nothing new in this idea; it is, in fact, the one almost universally prevalent amongst us. I have referred already to its extraordinary results, and have questioned the general competency of the buyer in this case to form a correct judgment of the value of the article he buys. It has certainly been assumed that he is competent; but the state of the market, and the general inferiority of the wares, invalidate the assumption. But there is the seller also. Let us look at him for a minute. Is he, in the first place, an experienced and well-informed judge of the article he sells? Well, he may be; but it is more likely in this case that he is not; and if he sells you bad and poisonous meat for good you have no sort of redress. You may try a dozen; and after suffering from each trial you may, perhaps,—for it is by no means certain,—hit upon a thoroughly good man. Is this a predicament in which to leave the education of the English people? No; we cannot admit that the fact that a man "chooses to fancy" that he has the ability to undertake a function constitutes a sufficient warrant for the indulgence of his fancy, and especially in a field of action where the dearest interests of society are at stake. We do not permit a man "who chooses to fancy" that he has ability to practise surgery to operate on our limbs *ad libitum*, and only when public opinion is roused to its danger decide whether he is fit to follow the profession of a surgeon. Nor do we allow a man who may "choose to fancy" that he has the ability to take the command of a man-of-war to undertake such a charge on the mere assurance that we may safely trust to his "inward impulse." And if we require the strictest guarantees of competency where our lives and property are risked, shall we be less anxious to secure them when the mental and moral lives of our children—the children of our commonwealth—are endangered? We cannot, then, accept the free trade theory as meeting the case. It has been tried long enough, and has been found utterly wanting. It has no tendency to supply us with the best article, and it virtually places the worst and the best on the same footing. The public of the year 2000 may perhaps think favourably of it; but then that public will consist of buyers competent to judge of what they are buying: the public of 1869 is not.

The second class of opponents was composed of those who would limit their interference with a teacher's qualifications to the scrutiny of his work periodically. "Let him be what he may," they say, "as far as preparation is concerned, if we find that he turns out good work—if his pupils stand a thorough examination—we have nothing more to do with the matter. By his fruits let him be known." This plea is so plausible, so much may be said for it, that when I begin to question whether it is perfectly satisfactory I may reckon on being deserted by some who have hitherto supported me. Still I venture on the ground. It does seem very fair and straightforward in a teacher to say—"If you doubt my qualifications for my office examine my work and form your own conclusions. You approve of the adage, 'As is the master, so is the school,'—trace me in my school, and give me credit for what you find." This does, I say, look extremely fair; and, if it is to be taken literally, it is a capital concession to the advancing power of Kosmos King, *vice* Chaos deposed. There are, however, two or three remarks to be made upon it. First, if we examine the work we must examine the whole, not merely a part of it. The goodness of a school cannot be judged by the success of a minority of its scholars. There are in nearly every school a few boys whom natural talent, stimulated by ambition, will carry on, by very little exertion on the part of the master, to a high pitch of advancement. These boys do, in fact, generally teach themselves, though the master gets—and often deservedly—the greatest part of the credit for their work. The striking success of these exceptional boys is not, however the test we seek. It is no evidence whatever that the general average of the teaching in the school is good. The examinations which are to test the qualifications and powers of the teacher must then be examinations of the whole school and not of its picked boys only. If out of a hundred pupils ninety are not in a satisfactory condition, whatever may be that of the remaining ten, the success of these is not to be attributed to the general goodness of the methods of teaching; while the failure of the ninety is distinctly chargeable with their general badness. It is plain that, if the methods are generally good, the result must be just the other way. Ninety would succeed, while ten might fail. Methods which, somehow or other, end in the failure of a large majority of the pupils cannot then be pronounced satisfactory. But, again, suppose that, on looking closely into the success of the one-tenth, we find that it consists in a result gained for the most part by a very mechanical exercise of the mind,—that the memory only, and not the reason, has had by far the greater share in the achievement,—that the knowledge gained, or apparently gained, so far from being digested and assimilated into the life-blood of the mental system, is mainly in so crude a condition that it is almost useless as a means to that end,—that the facts of which that knowledge consists are not only in a crude state when viewed individually, but are so unconnected with each other by natural association, as to be altogether unfitted to form the basis for that *science* which, in a later stage of the instruction, ought to be founded on them,—if, in short, on a fair and accurate scrutiny, we find that the success in question is rather due to cramming than to enlightened instruction,—are we, without hesitation, to congratulate the teacher on the result of his labours? Is it unjust to him to say that, had he been acquainted with better methods of teaching, the result would have been more valuable; and—if he will insist on our seeing him in his work—that the reflection proves the imperfection of the image? Any kind of exaggeration on my part would, I am aware, injure rather than aid the cause I wish to serve; and my statements and opinions will and ought to be reduced to their proper worth; but I believe that no one who has bestowed the same amount of pains upon the subject that I have done will judge me to be far wrong in the estimate I have formed. I therefore conclude, and hope I carry you with me in the conclusion, that the real value of results is to be estimated in connection with their causes; and as, by my argument, the teacher is responsible for the results of his teaching, that the examination of *his work* requires to be preceded by a preliminary examination of *himself*. This is conceded by those whom I placed in my third category, and the only difference I have with them consists in the different views we entertain respecting the nature of that preliminary examination. I do not agree with them in thinking that the examination should be merely an intellectual test. I think it should also test the teacher's ability to teach, and be itself the result of a special course of instruction and training in the theory and practice of education. I need not, however, dwell longer on this point. It has really formed the substance of my entire paper.

I have thus endeavoured to show:—

1. That the teacher is justly accredited with the good or bad results of his teaching.

2. That the test applied to English education generally proves that our teaching is to a large extent inefficient.

3. That the remedy for bad results is the reformation of their cause; in this case, the proper training and instruction of the teacher.

4. That this suitable and sufficient training, assumed in England to be absurd in conception and impossible in practice, is highly valued in idea, and accomplished in fact, in France and Germany.

5. That if teachers passed through a course of professional and instructive training as a test both of their interest in education and their fitness to undertake it, public opinion would begin to

recognise that fitness, and to honour proportionally the profession of the teacher; and that thus the interests of education, of teachers as a class, and of the entire community, would be advanced together.

6. That the application of the theory of commercial free trade to education is fallacious and mischievous, inasmuch as the general public, the buyers, cannot, until they are more educated themselves, be suitable judges of the quality of the wares—the education offered them.

7. That the test of results only is insufficient, inasmuch as, however valuable they are in appearance, they may be the product of contracted and unenlightened views, as embodied in practice, of true ends of education, and indeed may be entirely due to that "cramming" which is directly antagonistic to healthful mental training.

In conclusion, I beg to present you with a compressed statement that I have purposely left to the last, of certain facts, which none, I believe, can gainsay, and which serve to show what is at this moment the popular estimate of the value of the preliminary training and equipment of the teacher for his work. It consists of a brief report of some remarks I lately addressed, as one of a deputation from our Registration Society, to the President of the Committee of Council on Education. I stated that the perfectly unchartered "liberty of teaching" prevailing amongst us allows a man with the four following disqualifications for the office of a teacher to stand exactly on the same footing, as a candidate for public support, with the man who is perfectly qualified in the same respects:—

1. A man *destitute of all knowledge of the subject he professes to teach* may stand before the world as a teacher. Now, whether teaching be the communication of knowledge to the mind of another, or, as I rather believe, the direction of the pupil's mind in the process of acquisition, it is obvious, in the first case, that a man cannot give what he has not got, and in the second, that he cannot be an efficient guide in a path which he has not himself travelled before.

2. A man entirely *unapt to teach*, whether in the way of communication or superintendence, entirely inexperienced too, knowing nothing whatever of teaching as an art, and as conducted by those who are authorities in the profession; whose entire acquaintance with the subject consists in a cold and colourless reminiscence of that routine of his own school days which made him what he is—

such a man may, without any authorisation whatever, declare himself to be a teacher.

3. A man quite *ignorant of the principles of education*, which underlie the practice of the art, and which become, when truly possessed, a means of enlightenment and power to the teacher, as rendering him the master and not the slave of routine, may profess himself, unchallenged, a teacher.

4. A man may declare himself to be a teacher *who knows nothing whatever of the great practitioners and expounders of his art.* What those who have most profoundly investigated its principles have written, what those who have most successfully carried out its processes have done, may be utterly unknown by a person claiming to be regarded as a teacher. For him Quintilian, Ascham, Comenius, Locke, Pestalozzi, Jacotot, and even Arnold and Herbert Spencer, may have lived and laboured in vain. His own uninteresting and inefficient methods, his own self-devised principles of instruction, may be the sum of all that he knows on the subject.

Against such a state of things all teachers who are really interested in the general cause of education, in which their own is essentially included, ought loudly and perseveringly to protest.*

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* For additional enforcements of the argument for teaching the teacher, see specially Mr. Fitch's admirable Report to the Schools Inquiry Commission.

THE IMPORTANCE OF THE

TRAINING OF THE TEACHER.

"What is the whole business of education but a practical application of rules deduced from our own experiments, or from those of others, on the most effectual modes of developing and of cultivating the intellectual faculties and the moral principles?"—DUGALD STEWART.

[*Series published under the sanction of the National Union for Improving the Education of Women of all Classes.*—NO. IV. LONDON: WILLIAM RIDGWAY, 169, PICCADILLY, W. 1873.]

THE IMPORTANCE OF THE TRAINING OF THE TEACHER.

THIS subject, on which much has been at various times written and said to little practical purpose, is again coming to the front as one of paramount importance. No apology, therefore, is needed for pressing the consideration of it on the attention of all who are interested in the progress of education, and especially of all who are interested in the "National Union for improving the education of women of all classes."

Among the "objects" aimed at by the Union, one made especially prominent is this:—"To raise the Social Status of female teachers, by encouraging women to make teaching a profession, and to qualify themselves for it by a sound and liberal education. and by thorough training in the art of teaching." The "Social" bearings of the subject have been already treated by Miss Shirreff, in No. 3 of this series of pamphlets, and it is not necessary here further to speak of them. The special object I have in view is to call attention to "the training of the teacher in the art of teaching," and to show what is and what is not indicated by that expression.

In the first place, however, I wish to make a few remarks on the term "profession," as applied to teaching. It cannot be said, strictly, that we have in England, at this moment, any profession of teaching. The term "profession," when properly, that is, technically, employed, connotes or implies "learned," and involves the idea of an incorporated union of persons qualified by attainments and by a scientific training for a particular calling in life, and duly authorised to pursue it. It is in this sense alone that the term is employed in speaking of the professions of law, medicine, and theology. As, however, in the case of education—and speaking particularly of secondary education—no positive attainments, no special training, no authoritative credentials whatever are demanded as professional qualifications, it is obvious that there is, strictly speaking, no profession of teaching amongst us, and that when we use the term "profession" in this application of it, we use it in a vague, inaccurate, and untechnical sense. As to attainments none whatever are required of the person who "professes" to teach. The profound ignoramus, if sufficiently endowed with assurance, may compete for public patronage on nearly equal terms with the most cultivated student of learning and science, and may in many cases even carry off the prize; while as to training, the teacher who has severely disciplined his mind by the study of the theory of education, and carefully conformed his practice to it, scarcely stands a better chance of success than the ignorant pretender who cannot even define the term "education;" who has no conception of the meaning of "training;" and whose empirical self-devised methods of instruction constitute the sum total of his qualifications for the office he assumes.

Lastly, as to credentials, both classes of teachers, the qualified and the unqualified, stand on precisely the same footing before the public. No authoritative *exequatur* distinguishes the competent from the incompetent teacher. Both jostle each other in the strife for pre-eminence, and the public look on all the while with indifference, apparently unconscious that their children's dearest interests are involved in the issue.*

It is obvious then, that as neither knowledge, training, nor credentials are required of a teacher, there can be no "profession of teaching." The assumption, however, that there is such a profession, and that any one who pleases may claim to be a member of it, has proved very injurious to the interests of the public. Girls left unprovided for, young widows left in a similar predicament, and many others suddenly plunged into difficulties and obliged to cast about for a livelihood, often can think of no other employment than that of teaching, which, as being in common parlance "professional," is therefore "genteel;" and accordingly, without a single qualification, often with the disqualification that they have nearly all their previous lives regarded teachers and teaching with contempt, declare themselves before the world ready to teach. The declaration, if it means anything, means that they profess themselves ready to undertake the practice of an art which, beyond most others, requires peculiar knowledge, experience, culture, and tact. It means, further, that they are prepared to watch over the development of a child's growing mind, to furnish it with suitable mental food at the proper time, to see that the food is thoroughly digested, to stimulate it to exercise its faculties in the right direction, to curb its aberrations; to elicit the consciousness of independent power; to form, in short, habits of thinking for life-long use. All this, and very much more, is really involved in the conception we ought to form of a teacher's functions; and yet we see every day persons who have not even a conception of this conception: persons destitute of all knowledge of the subjects they profess to teach, of the nature of the mind which is to be taught, of the practical art itself, of the principles of education which underlie the art, and of the experience of the most eminent instructors, blindly and rashly forcing themselves before the world as teachers. Such persons seem not to be aware that if with similar qualifications they were to undertake to practise the arts of medicine, law, architecture, engineering, or music, they would be laughed at everywhere. Yet these very persons, who would be instinctively conscious of their incompetency, without knowledge or training, to perform a surgical operation, to steer a vessel, to build a house, or to guide a locomotive, are ready, at a moment's warning, to perform any number of operations on a child's mind, and to undertake the direction of the mental or moral forces—a task, considering the delicacy of the machinery with which they have to deal, more difficult in many respects than any other that can be named.

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* See Appendix.

In maintaining, however, generally that the professor of an art should understand its principles, and that he cannot understand them without study and training, I do not mean to assert that there may not be found among those who feel themselves suddenly called upon to act as teachers, especially among women, many who, without obvious preliminary training, are really already far advanced in actual training for the task they assume. In these cases, superior mental culture, acute insight into character, ready tact and earnest sympathy, constitute, *pro tanto*, a real preparation for the profession, and supply, to a considerable extent, the want of technical training. To such persons it not unfrequently happens that a matured consciousness of the importance of the task they have undertaken, and actual contact with the work itself, rapidly suggest what is needed to supplement their inexperience. Such cases, however, as being rare and exceptional, are not to be relied on as examples. Even in them, moreover, a thoughtful study of the Science of Education, and of the correlated Art, would guide the presumed faculty to better results than can be gained without it.

We can have little hesitation then in asserting that the pretension to be able to teach without knowing even what teaching means, without mastering its processes and methods as an art, without gaining some acquaintance with its doctrines as a science, without studying what has been said and done by its most eminent practitioners, is an unwarrantable pretension, which is so near akin to empiricism and quackery* that it is difficult to make the distinction.

There are, however, two or three fallacious arguments sometimes urged against the preliminary training of the teacher which it is important briefly to discuss.

The first is, that "granting the need of such training for teachers of advanced subjects, it is necessary for the teaching of elementary subjects. Anybody can teach a child to read, write, and cipher." This is, no doubt, true, if teaching means nothing more than mechanical drill and cram; but if teaching is an art, and requires to be artistically conducted, it is not true. A teacher is one who, having carefully studied the nature of the mind, and learned by reading and practice some of the means by which that nature may be influenced, applies the resources of his art to the child-nature before him. Knowing that in this nature there are forces, moral and intellectual, on the development of which the child's well-being depends, he draws them forth by repeated acts, exercises them in order to strengthen them, trains them into faculty, and continually aims at making all that he does, all that he gets his pupil to do, minister to the consciousness of growth and power in the child's mind. If this is a correct description of the teacher's function, it is obvious that it applies to every department of the teacher's work; as much to the teaching of reading and arithmetic as to that of Greek plays, or the Differential Calculus. The function does not change with the subject. But I go further, and maintain that the beginning of the process of education is even more important in some respects than the latter stages. *Il n'y a que le premier pas qui coûte.* The teacher who takes in hand the instruction and direction of a mind which has never been taught before, commences a series of processes, which by our theory should have a definite end in view—and that end is to induce in the child's mind the consciousness of power. Power is, of course, a relative term, but it is not inapplicable to the case before us. The teacher, even of reading, who first directs the child's own observation on the facts in view—the combinations of the letters in separate words or syllables—gets him to compare these combinations together, and notice in what respect they differ or agree, to state himself the difference or agreement—to analyse each new compound, into its known and unknown elements, applying the known, as far as possible, to interpret the unknown—to refer each fresh acquisition to that first made, to find out for himself everything which can be found out through observation, inference, and reflection—to look for no help, except in matters (such as the sounds) which are purely conventional—to teach himself to read, in short, by the exercise of his own mind—such a teacher, it is contended, while getting the child to learn how to read, is, in fact, doing much more than this—he is teaching the child how to use his mind—how to observe, investigate, think.* It will probably be granted that a process of this kind—if practicable—would be a valuable initiation for the child in the art of learning generally, and that it would necessarily be attended by what I have described as a consciousness of power. But, moreover—which is also very important—it would be attended by a consciousness of pleasure. Even the youngest child is sensible of the charm of doing things himself—of finding out things for himself; and it is of cardinal importance in elementary instruction to lay the grounds for the association of pleasure with mental activity. It would not be difficult, but it is unnecessary, to contrast such a method as this, which awakens all the powers of the child's mind, keeps them in vivid and pleasurable exercise, and forms good mental habits, with that too often pursued, which deadens the faculties, induces idle habits, distaste for learning, and incapacity for mental exertion.

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* "Empiric: one of a sect of ancient physicians, who practised from experience, not from theory."—"Quack: a boastful pretender to arts he does not understand."

It is clear, then, that "any teacher" cannot teach even reading, so as to make it a mental exercise, and, consequently, a part of real education—in other words, so as "to make all that he does, and all he gets his pupil to do, minister to the consciousness of growth and power in the child's mind." So far then from agreeing with the proposition in question, I believe that the early development of a child's mind is a work that can only effectually be performed by an accomplished teacher; such a one as I have already described. In some of the best German elementary schools men of literary distinction, Doctors in Philosophy, are employed in teaching children how to read, and in the highly organized Jesuit Schools, it was a regulation that only those teachers who had been specially successful in the higher classes should be entrusted with the care of the lowest.

There is, moreover, another consideration which deserves to be kept in view in discussing the competency of "any teacher" to take charge of a child who is beginning to learn. Most young untrained teachers fancy when they give their first lesson to a child who has not been taught before, that they are commencing its education. A moment's reflection will show that this is not the case. They may indeed be commencing its formal education, but they forget that it has been long a pupil of that great School of which Nature is the mistress, and that their proper function is to *continue* the education which is already far advanced. In that School, observation and experiment, acting as superintendents of instruction, through the agency of the child's own senses, have taught it all it knows at the time when natural is superseded, or rather supplemented, by formal education. Can it then be a matter of indifference whether or not the teacher understands the processes, and enters into the spirit of the teaching carried on at that former School; and is it not certain that his want of knowledge on these points will prove very injurious to the young learner? The teacher who has this knowledge will bring it into active exercise in every lesson that he gives, and, as I have shown in the case of teaching to read, will make it instrumental in the development of all the intellectual faculties of the child. He knows that his method is sound, because it is based on Nature; and he knows, moreover, that it is better than Nature's, because it supersedes desultory and fortuitous action by that which is organised with a view to a definite end. The teacher who knows nothing of Nature's method, and fails, therefore, to appreciate its spirit, devises at haphazard a method of his own which too generally has nothing in common with it, and succeeds in effectually quenching the child's own active energies; in making him a passive recipient of knowledge, which he has had no share in gaining; and in finally converting him into a mere unintellectual machine. Untrained teachers, especially those who, as the phrase is, "commence" the education of children, are, as yet, little aware how much of the dulness, stupidity, and distaste for learning which they complain of in their pupils, is of their own creation. The upshot then of this discussion is, not that "any teacher," but only those teachers who are trained in the art of teaching, can be safely entrusted with the education of the child's earliest efforts in the career of instruction.

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* See this process fully described in the Author's third lecture "On the Science and Art of Education," published by the College of Preceptors, p. 63.

Another fallacy, which it is important to expose, is involved in the assumption, not unfrequently met with, that a man's "choosing to fancy that he has the ability to teach, is a sufficient warrant for his doing so," leaving, it is added, "the public to judge whether or not he is fit for his profession." Ridiculous as this proposition may appear, I have heard it gravely argued for and approved in a conference of teachers, many of whom, no doubt, had good grounds of their own for their adherence to it. Simply stated, it is the theory of free trade in education. Every one is to be at liberty to offer his wares, and it is the buyer's business to take care that he is not cheated in the bargain. It is unnecessary for my present purpose to say more on the general proposition than this—that the state of the market and the frequent inferiority of the wares invalidate the assumption of the competency of the buyer to form a correct estimate of the value of the article he buys, and, moreover, that an immense quantity of mischief may be, and actually is, done to the parties most concerned, the children of the buyers, while the hazardous experiment is going on. As to the minor proposition, that a man's "choosing to fancy that he has the ability" to teach is a sufficient warranty for his doing so, it is obviously in direct opposition to the argument I am maintaining. It cannot for a moment be admitted that a man's "choosing to fancy that he has the ability" to discharge a function constitutes a sufficient warrant for the indulgence of his fancy, especially in a field of action where the dearest interests of society are at stake. We do not allow a man "who chooses to fancy that he has the ability" to practise surgery, to operate on our limbs at his pleasure, and only after scores of disastrous experiments, decide whether he is "fit to follow the profession" of a surgeon. Nor do we allow a man who may "choose to fancy that he has the ability" to take the command of a man-of-war, to undertake such a charge on the mere assurance that we may safely trust to his "inward impulse." And if we require the strictest guarantee of competency, where our lives and property are risked, shall we be less anxious to secure them when the mental and moral lives of our children—the children of our commonwealth—are endangered? I repudiate then entirely this doctrine of an "inward impulse," which is to supersede the orderly training of the teacher in the art of teaching. It has been tried long enough, and has been found utterly wanting. Fallacies, however, are often singularly tenacious of life, and we are not therefore surprised at Mr. Meiklejohn's* assertion, that in more than 50 per cent. of the letters which he examined, the special qualification put forward by the candidate was their "feeling" that they could perform the duties of the office in question *to their own satisfaction.*"(!) This is obviously only another specimen, though certainly a remarkable one, of the "inward impulse" theory.

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* See Appendix.

The third fallacy I propose to deal with is couched in the common assumption that "any one who knows a subject can teach it." There can be no doubt that the teacher should have an accurate knowledge of the subject he professes to teach, and especially for this, if for no other reason—that as his proper function is to guide the process by which his pupil is to learn, it will be of the greatest advantage to him as a guide to have gone himself through the process of learning. But, then, it is very possible that although his experience has been real and personal, it may not have been conscious—that is, that he may have been too much absorbed in the process itself to take account of the natural laws of its operation. This conscious knowledge of the method by which the mind gains ideas is, in fact, a branch of Psychology, and he may not have studied that science. Nor was it necessary for his purpose, as a learner, that he should study it. But the conditions are quite altered when he becomes a teacher. He now assumes the direction of a process which is essentially not his but the learner's; for it is obvious that he can no more think for the pupil than he can eat or sleep for him. His efficient direction, then, will mainly depend on his thoughtful conscious knowledge of all the conditions of the problem which he has to solve. That problem consists in getting his pupil to learn, and it is evident that he may know his subject, without knowing the best means of making his pupil know it too, which is the assumed end of all his teaching: in other words, he may be an adept in his subject, but a novice in the art of teaching it. Natural tact and insight may, in many cases, rapidly suggest the faculty that is needed; but the position still remains unaffected, that knowing a subject is a very different thing from knowing how to teach it. This conclusion is indeed involved in the very conception of the art of teaching, an art which has principles, laws, and processes peculiar to itself.

But, again, a man profoundly acquainted with a subject may be unapt to teach it by reason of the very height and extent of his knowledge. His mind habitually dwells among the mountains, and he has therefore small sympathy with the toilsome plodders on the plains below. It is so long since he was a learner himself that he forgets the difficulties and perplexities which once obstructed his path, and which are so painfully felt by those who are still in the condition in which he once was himself. It is a hard task, therefore, to him to condescend to their condition, to place himself alongside of them and to force a sympathy which he cannot naturally feel with their trials and experience. The teacher, in this case, even less than in the other, is not likely to conceive justly of all that is involved in the art of teaching, or to give himself the trouble of acquiring it. Be this, however, as it may, both illustrations of the case show that it is a fallacy to assert that there is any necessary connection between knowing a subject, and knowing how to teach it.

Having now shown that the present state of public opinion in England, which permits any one who pleases to "set up" as a teacher without regard to qualifications is inconsistent with the notion that teaching is an art for the exercise of which preliminary training is necessary, and disposed of those prevalent fallacies which are, to a great extent, constituents of that public opinion, I proceed to give some illustrations of teaching as it is in contrast with teaching as it should be. The fundamental proposition, to which all that I have to say on the point in question must be referred, is this—that teaching, in the proper sense of the term, is a branch of education, and that education is the development and training of the faculties with a view to create in the pupil's mind a consciousness of power. Every process employed in what is called teaching that will not bear this test is, more or less, of the essence of cramming, and cramming is a direct interference with, and antagonistic to, the true end of education. Cramming may be defined for our present purpose as the didactic imposition on the child's mind of ready-made results, of results gained by the thought of other people, through processes in which his mind has not been called upon to take a part. During this performance the mind of the pupil is for the most part a passive recipient of the matter forced into it, and the only faculty actively employed is memory. The result is that memory, instead of being occupied in its proper function of retaining the impression left on the mind by its own active operations, and being therefore subordinate and subsequent to those operations, is forced into a position to which it has no natural right, and made to precede, instead of waiting on, the mind's action. Thus the true sequence of causes and consequences is disturbed, and memory becomes a principal agent in instruction. If we further reflect that ideas gained by the direct action of the mind naturally find their proper place among the other ideas already existing there by the law of association, while those arbitrarily forced into it do so only by accident—for the mind receives only that which it is already prepared to receive—we see that cramming, which takes no account of preparedness, is absolutely opposed to development, that is, to education in the true sense of the term. Cramming, therefore, has nothing in common with the art of teaching, and the great didactic truth is established that it is the manner or method, rather than the thing taught, that constitutes the real value of the teaching.

Mr. D'Arcy Thompson, in his interesting book entitled "Wayside Thoughts," referring to the usual process of cramming in education, compares it to the deglutition by the boa constrictor of a whole goat at a meal, but he remarks that while the boa by degrees absorbs the animal into his system, the human boa often goes about all his life with the undigested goat in his stomach! There may be some extravagance in this whimsical illustration, but it involves, after all, a very serious truth. How many men and women are there who, if they do not carry the entire goat with them throughout life, retain in an undigested condition huge fragments of it, which press as a dead weight on the system—a source of torpidity and uneasiness, instead of becoming through proper assimilation a means of energy and power. The true educator, who is at the same time a genuine artist, proceeds to his work on principles diametrically opposed to those involved in cramming. In the first place he endeavours to form a just conception of the nature, aims, and ends of education, as of a theory which is to govern his professional action. According to this conception "education is the training carried on consciously and continuously by the educator with the view of converting desultory and accidental force into organised action, and of ultimately making the child operated on by it a healthy, intelligent, moral, and religious man." Confining himself to intellectual training, he sees that this must be accomplished through instruction, which is "the orderly placing of knowledge in the mind with a definite object; the mere aggregation of incoherent ideas, gained by desultory and unconnected mental acts, being no more instruction than heaping bricks and stone together is building a house."* These conceptions of the nature and aim of education, and of its proper relation to instruction, suggest to him the consideration of the means to be employed. These means, to be effectual, must have an exact scientific relation to the nature of the machinery that is to be set in motion—a relation which can only be understood by a careful study of the machinery itself. If it is a sort of machinery which manifests its energies in acts of *observation*, *perception*, *reflection*, and *remembering*, and depends for its efficacy upon *attention*, he must study these phemomena subjectively in relation to his own conscious experience, and objectively as exhibited in the experience of others. Regarding, further, this plexus of energies as connected with a base to which we give the name of mind, he must proceed to study the nature of the mind in general, and especially note the manner in which it acts in the acquisition of ideas. This study will bring him into acquaintance with certain principles or laws which are to guide and control his future action. The knowledge thus gained will constitute his initiation into the Science and Art of Education.

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* See the author's "Lectures on the Science and Art of Education."

The Science or Theory of Education then is seen to consist in a knowledge of those principles of Psychology which account for the processes by which the mind gains knowledge. It therefore serves as a test by which the Art or Practice of Education may be tried. All practices which are not in accordance with the natural action of the mind in acquiring knowledge for itself are condemned by the theory of education, and in this predicament is cramming, which consists in forcing into the mind of the learner the products of other people's thought. Such products are formulæ, rules, abstract general propositions, definitions, classifications, technical terms, common words even, when they are not the signs of ideas gained at first-hand by his own observation and perception. The Science of Education recognises all these kinds of knowledge as necessary to the formation of the mind, but relegates them to their proper place in the course of instruction, and determines that that place is subsequent, not antecedent, to the action of the learner's mind on the facts which serve as their groundwork. Facts, then, things, material objects, natural phenomena; physical facts, facts of language, facts of nature, are the true, the all-sufficient pabulum for the youthful mind, and the careful study and investigation of them at first-hand, through his own observation and experiment, are to constitute his earliest initiation in the art of learning. After this initiatory practice, which involves analysis and disintegration, come, as the natural sequence, the processes of reconstruction and classification of the elements obtained, induction, framing of definitions, building up of rules, generalisation of particulars, construction of formulæ, application of technical terms, in all which processes the art of the teacher as a director of the learner's intellectual efforts is manifestly called into exercise; and the need of his own experimental knowledge of the processes he has to direct is too obvious to require to be insisted on.

The comprehensive principle here enunciated, which regards even the learning by rote of the multiplication table and Latin declensions, antecedently to some preliminary dealing with the facts of Latin and the facts of number, as of the essence of cramming, will be theoretically received or rejected by teachers just in proportion as they receive or reject the conception of an art of teaching founded on intellectual principles. It is obvious enough that cramming knowledge into the memory, without regard to its fitness for mental digestion, if an art at all, is an art of a very low order, and has little in common with that which consists in a conscious appreciation of the means whereby the mind is awakened to activity, and its energies trained to independent power. The teacher, in fact, in the one case is an artist, scientifically working out his design in accordance with the principles of his art, and ready to apply all its resources to the emergencies of practice; in the other case, he is an artisan empirically working by rule-of-thumb, unfurnished with principles of action, and succeeding, when he succeeds at all, through the happy accident that the pupil's own intellectual activity practically defeats the natural tendency of the teacher's mechanical drill.

I do not, however, by any means pretend to assert that every teacher who declines to accept this notion of teaching as an art is an artisan. It often happens that a man works on a theory which he does not consciously appreciate, and in his actual practice obviates the objection which might be taken against some of his processes. Hence we find teachers, while denouncing such expressions as "development and cultivation of the intelligence" as "frothy,"* doing practically all they can to develop and cultivate the intelligence of their pupils. Such teachers do indeed violently drive "the goat" into the stomach of their pupils, but when they have got it there take great pains to have it digested in some fashion or other. I believe that the process would be much facilitated by their knowing something of the physiology of digestion, but I do not therefore designate such practitioners as artisans. At the same time I do not call them artists, for their procedure violates nature, and true art never does that. The epithet artisan may, however, be restricted to those *—and the number is legion—whose practice consists of cramming pur et simple.*

On the whole, then, I contend that if we could examine the *entire practice* of those teachers who actually succeed in endowing the large majority—*not a select few*—of their *pupils* with sound and systematic knowledge, and with well-formed minds, we should find that, whatever be their theoretic notions, they have worked on the principles on which I have been all along insisting. They have succeeded by the development and cultivation of the intelligence of their pupils, and by nothing else, and they have succeeded just in proportion as they have consciously kept this object in view. Let us hear what Dean Stanley tells us of Arnold's teaching. "Arnold's whole method was founded on the principle of awakening the intelligence of every individual boy. Hence it was his practice to teach, not, as you perceive, by downpouring, but by questioning. As a general rule he never gave information except as a reward for an answer, and often withheld it altogether, or checked himself in the very act of uttering it, from a sense that those whom he was addressing had not sufficient interest or sympathy to entitle them to receive it. His explanations were as short as possible, enough to dispose of the difficulty and no more, and his questions were of a kind to call the attention of the boys to the real point of every subject, to disclose to them the exact boundaries of what they knew and did not know, and to cultivate a habit not only of collecting facts, but of expressing themselves with facility, and of understanding the principles on which these facts rested." Such was Arnold's method of teaching; and it is obvious that, *mutatis mutandis*, modified somewhat so as to apply to the earliest elementary instruction, it involves all the principles which I have contended for, as constituting the true art of teaching. The boys were, in fact, teaching themselves under the direction of the teacher without, or with, the slightest explanation on his part. They were using all their minds on the subject, and gaining independent power. Arnold, to use a famous French teacher's expression, was "labouring to render himself useless."

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* See a letter in the "Educational Times," for December, 1872, from the Rev. E. Boden, Head Master of the Clitheroe Royal Grammar School.

But I must draw these remarks to a conclusion. It is hardly necessary for me to state formally the principles for which I have been all along arguing.

The upshot is this—Teaching is not a blind routine but an art, which has a definite end in view. An art implies an artist who works by systematic rules. The processes and *rules of art explicitly or implicitly* evolve *the principles involved in science.* The art or practice of education, therefore, is founded on the science or theory of education, while the science of education is itself founded on the science of mind, or psychology. The complete equipment and *training of the teacher for his profession comprehends therefore*—

(*a.*) A knowledge of the subject of instruction.

(*b.*) A knowledge of the nature of the being to be instructed.

(*c.*) A knowledge of the best methods of instruction.

This knowledge, gained by careful study and conjoined with practice, constitutes the training of the teacher.

APPENDIX.

A very instructive instance, as showing the popular estimate of the "qualifications" deemed necessary at this very moment for the equipment of the teacher, was recently brought forward by Mr. Meiklejohn, in a lecture delivered at the College of Preceptors. The Principal of a Ladies' College required the assistance of a Lady Superintendent to take charge of the educational work of her establishment. In reply to an advertisement, in which she stated the duties of the office and the salary offered (one hundred guineas per annum, with rooms and board), she received about nine hundred letters. In her perplexity under this *embarras de richesses*, Mr. Meiklejohn offered to look over and report upon three hundred of these epistles. He found, as the result, that about five per cent. of them were "good and hopeful;" while the remaining ninety-five per cent. "showed every variety of incapacity and ignorance, and furnished examples of every kind of sin against common sense and the English language." As evidence on this last point he quotes numerous instances of spelling, such as "widdow," "affraid," "caricter," "responcible," "schollar," "controle," "referrence," "exclent," "apoint an intervew," &c.; of expression, such as "yrs respectively," "quite compitant of undertaking," "with great kindness to young people, being exceedingly fond of the above," "wishes to resort to some capacity by way of employment," &c.; and of "qualifications," such as "can refer to Cannons," "is not so strong in the chest as she used to be," "has gone through fever and small-pox cases very successively," "is a Baronness," "is the widow of 'a Commercial,' and has four small children," "has never held a similar post, and will soon be thirty-five," "has had experience in the management of a large institution for babies," "is of exceedingly imposing appearance," "at present fills a situation which she would be happy to resign," "can carve well and quickly," "can make nourishing soups, or get them made," &c., &c. It is sad to conceive of nine hundred distressed women catching thus eagerly at the offer of the salary, but even more sad, in the interest of education itself, to think of the mean idea they must have entertained of what is indicated by "educational work."

THEORIES OF TEACHING,

WITH THEIR

CORRESPONDING PRACTICE.

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THERE are, as we know, many methods of teaching. There are, for instance, Ascham's, Hamilton's, and Ollendorf's method of teaching languages, and Pestalozzi's and Jacotot's methods of teaching generally; there are the methods of the old Grammar School, and those of the Dame Schools, and of the Kindergarten, and a great many others. Each of these has a theory which underlies it and accounts for its speciality. Into the details, however, of various methods I am not about to enter; my purpose is the more general one of endeavouring to ascertain the leading spirit which pervades them all, independently, for the most part, of the details.

A little consideration of the subject will, I believe, justify us in taking, as the criterion of this spirit, the aspect under which we regard the *relation of the teacher to the pupil*, and of both to their joint work. One teacher may regard the communication of his own ideas to his pupil as his proper and special function, and their minds as a of sort *tabula rasa*, on which he has to write himself. According to this theory, he will then treat them merely as recipients, and will carefully tell them what they ought to receive, and how they ought to receive it. In placing facts before them he will tell them what conclusions they are to draw from them. When his pupils commit faults he will correct them himself, even though no use whatever is made of the corrections by them. He will be so careful that the pupil should not go wrong that he will continually interfere with his free action, by urging him to aim at this point and avoid that—in short, he will assume that the ability of the pupil to observe, compare, reason, think, depends almost entirely upon his own continual telling, showing, explaining, and thinking for him. Such a teacher evidently has a mean opinion of the pupil's powers: he assumes that they cannot work without the constant intervention of his own, and considers that in the joint operation carried on by himself and his pupil, he takes, and ought to take, the larger share.

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* Read at a meeting of the Education Department of the Social Science Association, Monday, April 26, 1869.

Another teacher entertains a very different view of the relation he sustains to his pupil. He sets out, indeed, with a different estimate of the pupil's native ability, which he regards as competent to observe facts, compare them together, and draw inferences respecting them without any authoritative interference on his part. He sees this native faculty at work in daily life, and therefore knows that it can be employed in self-instruction. He trusts in it, therefore, and never tells the pupil what he can find out for himself; he does not superfluously explain relations between objects or facts which explain themselves by the simple juxtaposition of the objects and facts. He does not correct blunders which almost invariably arise either from insufficient knowledge or from carelessness: in the one case he requires the pupil to gain the knowledge required, or leaves the blunder for subsequent correction; in the other he demands more attention, and expects the pupil to correct his own blunders. He feels no inordinate anxiety about his pupil's occasional errors of judgment, provided that his mind is actively engaged in the subject under instruction; in short, seeing that the child is pursuing, in a natural way, his own self-teaching, he is anxious not to supersede his efforts by any needless, and probably injurious, interference with the process. He judges, therefore, that in the joint operation referred to it is the pupil and not himself who is to take the far larger share, inasmuch as the pupil's ultimate power of thinking will be in the inverse ratio of the teacher's thinking for him.

It is evident that these different conceptions of the relation between the teacher and the pupil are not easily reconcilable with each other, and that the practical results must be respectively very different. These results I will not now endeavour to estimate, but address myself to my immediate purpose, which is to maintain the latter theory, and to show that *learning is essentially self-tuition*, and *teaching the superintendence of the process;* and, in short, that compendiously stated, the essential function of the teacher consists in helping the pupil to teach himself.

It may be worth while to inquire for a few minutes into the exact meaning, as fixed by etymological considerations, of the words *learn* and *teach*. As words represent ideas, we may thus ascertain what conceptions were apparently intended to be represented by these or equivalent symbols. Now it does seem remarkable that, in European languages at least, to *learn* means to gather or glean for oneself—and *teach*, to guide or superintend. In no case that I am aware of do these words imply a correlation of *receptivity* on the one hand, with *communicativeness* on the other. A brief reference to the facts will be sufficient to show this. I take the word *learn* first, because *learning* must precede *teaching*. *Learn*, in the earliest form of our language, which we erroneously call Anglo-Saxoni nstead of Original or Primitive English, was *leorn-ian*, a derivative of the simpler form *lær-an*, to teach. There is reason to believe that the longer form with the epenthetic *n* represents a class of words once not uncommon in Gothic languages, though now no longer recognised in practice—I mean words endued in themselves with the functions of reflective or passive verbs. Thus, in Mœso-Gothic, we have *lukan*, to shut or lock up, *lukn-an* to lock oneself up, or to be locked up; *wak-an*, to wake another, *wakn-an*, to wake oneself, to be awake. We have the corresponding *awake* and *awaken* ourselves. If this analogy be correct, then *leorn-ian*, as connected with *lær-an*, to teach, means to teach oneself, *i.e.*, to learn. As, however, the director of a work often gets the credit due to his subaltern, so the person who directed his pupil to do his work of teaching himself was formerly said—and the usages till exists—to *learn* or *larn* the pupil. In nearly all European languages this double force of the word is found. Three hundred years ago even it was unquestionably good English to say, as Cranmer does in his version of the Psalter—"Lead me forth in thy truth and *learn* me," and as Shakespeare does in the person of Caliban—"the red plague rid you for *learning* me your language." But what does the original root *lær* mean? It is evidently equivalent to the Mœso-Gothic *lais* or *les*; *s* being interchangeable with *r*, as we see in the Latin *arbos*, *arbor*, and in the German *eisen*, compared with our *iron*. But the Mœso-Gothic *lais* or *les* is identical with the German *les* or *lesen*, and means to *pluck*, *gather*, *acquire*, *read*, *learn*, and we have still a trace of it in our provincial word *leasing*—gleaning or gathering up. The primitive meaning then of the root *lær*, of our original English, must have been the same as that of the Mœso-Gothic *les*, though, for reasons already referred to, the causative sense to *make*, *to gather*, *acquire or learn*, must have been very early superadded. On the whole, then, it appears sufficiently clear that to *learn* is to gather or glean for oneself—*i.e.*, to teach oneself. But the correlative *teach* also requires a moment's consideration. This is derived from, or equivalent to, the original English, *tæc* or *tæch* (in tæc-an or tæch-an), to the German *zeig* (in *zeigen*), to the Mœso-Gothic *tech* (in *techan*), to the Latin *doc* (in *docere*), or *dic* in di(c)scere (of which the ordinary form is discere), and to the Greek δεικ (in δείκνυμι). This common root means to *show, point out, direct, lead the way.* The same idea is conveyed by the French equivalents *montrer* and *enseigner*, both meaning, as we know, to teach.

The etymology, then, in both instances supports the theory that *learning* is gathering up or acquiring for oneself, and *teaching*, the guiding, directing, or superintending of that process.

The pupil, then, by this theory, is to advance by his own efforts, to work for himself, to learn for himself, to think for himself; and the teacher's function is to consist mainly in earnest and sympathising direction. He is to devote his knowledge, intelligence, virtue, and experience to that object. He has himself travelled the road before, which he and his young companion are to travel together; he knows its difficulties, and can sympathise with the struggles which must be made against them. He will therefore endeavour to gain his pupil's confidence, by entering into them, and by suggesting adequate motives for exertion when he sees the needful courage failing. He will encourage and animate every honest and manful effort of his pupil, but, remembering that he is to be a *guide* and not a *bearer*, he will not even attempt to supersede that labour and exercise which constitute the value of the discipline to the pupil, and which he cannot take upon himself without defeating the very end in view.

It is worth while here to meet a plausible objection which has been taken against this view of the teacher's function. If, it is said, the pupil really after all learns by himself without the intervention of the teacher's mind in the process—though the intervention of his *moral* influence is strenuously insisted on—then this superintendent of other people's efforts to gain knowledge may really have none himself; this director of machinery may know nothing of mechanics. This objection is pertinent and deserves attention. It is obvious that the teacher who is really able to enter into his pupil's difficulties in learning effectually ought to be well-furnished with knowledge and experience. Knowledge of the subject under instruction is to be required of the teacher, both because the recognised possession of it gives him weight and influence, and because the possession of a large store of well digested knowledge is itself distinct evidence that its owner has gone through a course of healthful mental discipline, and is on that ground—other things being equal—a fit and proper person to superintend those who are going through the same discipline.

Knowledge also of a special kind he ought to have—that derived from thoughtful study, accompanied by practice, of the machinery which he is to direct. He is not, by the assumption, himself an essential part of it, but as an overlooker or engineer he certainly ought to be acquainted with its nature and construction, so as to be able to estimate its working power, and to know when to start and when to stop it, to prevent both inaction and overaction. A teacher, then, without some knowledge of psychology, gained both systematically and by experience and observation, could hardly be considered as fully equipped for his work. But I need not dwell further on this point, though I could not well leave it unnoticed.

It appears, then, that the teacher of a pupil who teaches himself will find quite enough to do in his work of superintendence and sympathy. It is only as far as the mental process of learning that the pupil is in any sense independent of him.

I do not profess to describe in philosophic terms what the mental process which we call learning really is, but it is necessary for my argument to maintain that, whatever it is, it can no more be performed by deputy than eating, drinking, or sleeping, and further, that every one engaged in performing it is really teaching himself. If, then, the views I have suggested of the relation between the teacher and the learner be generally correct, and the latter really learns by teaching himself, it would follow that if we could only ascertain his method as a learner, we should obtain the true elements of ours as teachers; or, in other words, that the true principles of the art of teaching would be educed from those involved in the art of learning, though the converse is by no means true.

The establishment of these principles would furnish us with a test of the real value of some of the practices in current use amongst teachers, and perhaps help to lay the foundation of that teaching of the future which will, as I believe, identify self-tuition, under competent guidance, with the scientific method of investigation.

But I must endeavour to enlarge the field of inquiry, and show that self-tuition under guidance is the only possible method in the acquirement of that elementary instruction which is the common property of the whole human race. Long before the teacher, with his apparatus of books, maps, globes, diagrams, and lectures, appears in the field, the child has been pursuing his own education under the direction of a higher teacher than any of those who bear the technical name. He has been learning the facts and phenomena which stand for words and phrases in the great book of Nature, and has also learned some of the conventional signs by which those facts and phenomena are known in his mother-tongue.

As my general proposition is that the art of teaching should be, as far as possible, founded on those processes by which Nature teaches those who have no other teacher—those who learn by themselves—it is important to glance at a few of these processes.

Nature's earliest lessons consist in teaching her pupils the use of their senses. The infant, on first opening his eyes, probably *sees* nothing. A glare of light stimulates the organ of sight, but makes no distinct impression upon it. In a short time, however, the light reflected from the various objects around him impinges, with more or less force, upon the eye, and impresses upon it the images of things without, the idea of the image is duly transferred to the mind—and thus the first lesson in seeing is given.

This idea of form is, however, complex in its character, which arises from the fact that the objects presented to his attention are wholes or aggregates. He learns to recognise them in the gross before he knows them in detail. He has no choice but to learn them in this way. No child ever did learn them in any other way. Nature presents him with material objects and facts, or things already made or done. She does not invite him, in the first instance, before he knows in a general way the whole object, to observe the constituent parts, nor the manner in which the parts are related to the whole. She never, in condescension to his weakness of perception, separates the aggregate into its component elements—never presents these elements to his consideration one by one. In short, she ignores altogether in her earliest lessons the synthetical method, and insists on his employing only the analytical. As a student of the analytical method he proceeds with his investigations, observing resemblances and differences, comparing, contrasting, and to some extent generalising (and thus using the synthetical process), until the main distinctions of external forms are comprehended, and their more important parts recognised as distinct entities, to be subsequently regarded themselves as wholes and decomposed into *their* constituent parts. Thus the child goes on with Nature as his teacher, learning to read for himself and by himself the volume she spreads out before him, mastering first some of its sentences, then its phrases and words, and, lastly, a few of its separate letters.

So with regard to the physical properties of objects as distinguished from their mechanical divisions or parts. What teacher but Nature makes the child an embryo experimental philosopher? It is she who teaches him to teach himself the difference between hard and soft, bitter and sweet, hot and cold. He lays hold of objects within his reach, conveys them to his mouth, knocks them against the table or floor, and by performing such experiments incessantly, gratifies, instructs, and trains the senses of sight, touch, taste, smelling, and hearing. At one time a bright and most attractive object is close at hand. It looks beautiful, and he wonders what it can be. Nature whispers, "Find out what it is. Touch it." He puts his fingers obediently into the flame, burns them, and thus makes an experiment, and gains at the same time an important experience in the art of living. He does not, however, feel quite certain that this may not be a special case of bad luck. He therefore tries again, and of course with the same result. And now, reflecting maturely on what has taken place, he begins to assume that not only the flame already tried, but all flames will burn him—and thus dimly perceiving the relation between cause and effect, he is already tracking, though slowly and feebly, the footsteps of the inductive philosophy. Even earlier in life—as soon, indeed, as he was born, as Professor Tyndall remarks—urged by the necessity of doing something for his living, he improvised a suction-pump, and thus showed himself to be, even from his birth, a student of practical science.

These instances will serve to show that Nature's earliest lessons are illustrations of the theory, that teaching essentially consists in aiding the pupil to teach himself. The child's method of learning is evidently self-tuition under guidance, and nothing else. He learns, *i.e.*, gathers up, acquires, knows a vast number of facts relating to things about him; and, moreover, by imitation solely, he gains a practical acquaintance with the arts of walking, seeing, hearing, &c. Who has taught him? Nature—himself—practically they are one. In the ordinary sense, indeed, of the word teaching, Nature has not taught him at all. She has given him no rules, no laws, no abstract principles, no formulæ, no grammar of hearing, seeing, walking, or talking; she simply gave the faculty, supplied the material, and the occasion for its exercise, and her pupil learnt to do *by doing*. This is what Nature, the teacher, the guide, the directrix, did. But something more she did, or rather in her wisdom left undone. When her pupil, through carelessness and heedlessness, failed to see what was before him, when he blundered in his walking or talking, she neither interposed to correct his blunders, nor indulged in outcries and objurgations against him. She bided her opportunity. She went on teaching, he went on learning, and the blunders were in time corrected by the pupil himself. Even when he was about to burn his fingers it was no part of her plan to hinder him from learning the valuable lessons taught by the ministry of pain. Perhaps in these respects, as well as in so many others, teachers of children might learn something from the example of their great Archididascalos.

But it will be objected that Nature's wise, authoritative teaching, can be no guide for us. She teaches by the law of exigency, and her pupil must perforce learn whether he will or not. In the society in which we live there is no such imperative claim, and the teacher who appears as Nature's deputy can neither wield her authority nor adopt her methods. In reply to this objection it may be urged that Society's claims upon her members are scarcely less imperative than Nature's, and that the deputy can and ought to act out his superior's principles of administration.

Suppose then, for instance, that Society requires that a child should learn to read. In this case, certainly, Nature will not intervene to secure that special instruction, but the method adopted by her deputy may be, and ought to be, founded on hers. Every principle of Nature's teaching is violated in the ordinary plan of commencing with the alphabet. Nature, as I have already said or implied, sets no alphabet whatever before her pupil; nor is there in the teaching of Nature anything that even suggests such a notion as learning A, B, C. Nature's teaching, it cannot be too frequently repeated, is, at first analytical, *not* synthetical, and the essence of it is that the pupil makes the analysis himself.

Our ordinary teacher, however, in defiance of Nature, commences his instructions in the art of reading with A, B, C, pointing out each letter, and at the same time uttering a sound which the child is expected to consider as the sound always to be associated with that sign. At length, after many a groan, the alphabet is learned perfectly and the teacher proceeds to the combinations. He points to a word, and the pupil says, letter by letter, *bee-a-tee* and then, naturally enough, comes to a dead stop. His work is done. Neither he nor Sir Isaac Newton in his prime, could take the next expected step and compound these elements into *bat*. The sphynx who proposes the riddle may indeed look menacingly for the answer, but by no possible chance can she get it. The teacher then comes to the rescue, utters the sound *bat*, which the child duly repeats, and thus the second stage in reading is accomplished.

It will be observed that the only rational and sensible feature in this process is the utterance and echo of the sound *bat* in view of the word or sign, and if the teacher had begun with this, and not confused the child by giving him the notion that he was learning a *sound*, when he was in fact learning nothing but a *name*, Nature would have approved of the lesson, as analogous to those given by herself. She might also have asked the teacher to notice that the child learns to speak by hearing and using whole words. Nobody addresses him as *bee-a-bee-wy*, nor does he say *em-a-em-em-a*. He, in fact, deals with aggregates, compares them together, exercises the analytical faculty upon them, and employs the constituent elements which he thus obtains in ever new combinations. There can be no doubt, then, that the child learns to speak by imitation, analysis, and practice. Why not, then, says Nature, let him learn reading in the same way? Let him in view of entire words echo the sound of them received from the teacher; let him learn them thoroughly as wholes, let him by analysis separate them into their syllables, and the syllables into their letters, and it will be found that the phonic faculty of the compound leads surely and easily to that of its separate parts. The fact that our orthography is singularly anomalous is an argument for, rather than against, the adoption of this plan of teaching to read.

In pursuing this only natural method of instruction we notice that the pupil frequently repeats the same process, going over and over the same ground until he has mastered it, and as in learning to walk he often stumbled before he walked freely, and in learning to talk often blundered and stammered before he used his tongue readily, so while learning to read in Nature's school he will make many a fruitless attempt, be often puzzled, often for a while miss his path, yet all the while he is correcting his errors by added knowledge and experience, sharpening his faculties by practice, teaching himself by his own active efforts, and not receiving passively the explanations of others; deeply interested, too, in discovering for himself that which he would be even disgusted with if imposed upon by dogmatic authority, he is trained, even from the very beginning, in the method of investigation. I cannot but look upon him as illustrating faithfully and fairly in his practice the theory that learning is self-tuition under competent guidance, and that teaching is, or ought to be, the superintendence of the process.

Did time permit I could give many illustrations of the interest excited, and the efficiency secured, by this method of teaching reading. For example, I have seen and heard children earnestly petitioning to be allowed to pursue their lessons in reading, after a short experience of it, by what they called the "finding out plan." It was known to me more than forty years ago, as a part of Jacotot's once renowned "Enseignement Universel," and I then put it to the severest test. It is also substantially contained in Mr. Curwen's "Look and Say method," in the little book entitled "Reading without Spelling, or the Scholar's Delight," and in articles by Mr. Dunning and Mr. Baker, of Doncaster, in the *Quarterly Journal of Education* for 1834. A natural method, like others, requires of course to be judiciously directed, and the teacher's especial duty is in this, as in other methods, to maintain the interest of the lesson, and above all, to get the pupil, however young he may be, *to think*; especially as, according to the principles already laid down, it is rather the pupil who *learns* than the master who *teaches.* As a case in point I quote a passage from the life of Lord Byron. Speaking of a school he was in when five years of age, he says, "I learned little there except to repeat by rote the first lesson of monosyllables, 'God made man, let us love him, &c.,' by hearing it often repeated, without acquiring a letter. Whenever proof was made of my progress at home, I repeated these words, with the most rapid fluency, but on turning over a new leaf, I continued to repeat them, so that the narrow boundaries of my first year's accomplishments were detected, my ears boxed (which they did not deserve, seeing that it was by ear only that I had acquired my letters), and my intellects consigned to a new preceptor." This case, however, proves only that Byron had not been directed in teaching himself, and that he was not a pupil of the analytical method. His mind had taken no cognisance of the acquisitions which he had mechanically made.

Another instance, much more to the point, is supplied in a passage which I extracted many years ago from a Report of the Gaelic School Society, and which contains a most valuable lesson for the teachers of reading. "An elderly female in the parish of Edderton was most anxious to read the Scriptures in her native tongue. She did not even know the alphabet, and of course she began with the letters. Long and zealously she strove to acquire these, and finally succeeded. She was then put into the syllable class, in which she continued some time, but made so little progress that with a breaking heart she retired from the school. The clergyman of the parish, on being made acquainted with these circumstances, advised the teacher to send for her again, and instead of trying her with syllables, to which she could attach no meaning, to give her the sixth Psalm at once. This plan succeeded to admiration: and when the school was examined by a committee of presbytery, she read the thirty-seventh Psalm in a manner that astonished all present." Whether this important discovery—for it was nothing less—was made practically available in the teaching of the parish of Edderton I do not know; but I should not be surprised to find that the good old A, B, C, and the cabalistical b-a, ba; b-e, be,—in which Dr. Andrew Bell gravely tells us "the sound is an echo to the *sense!*"—is still going on there as at the beginning.

I have detained you long over the practical illustration contained in this method of teaching to read, because it really is a complete application of the theory which I advocate, and involves such principles as these, which I state with the utmost brevity for want of time:—

1. The pupil, teaching himself, begins with tangible and concrete facts which he can comprehend, not with abstract principles which he cannot.
2. He employs a method—the analytical—which lies in his own power, not the synthetical, which mainly requires application *ab extra.*
3. His early career is not, therefore, impeded by needless precepts, and authoritative dogmas.
4. He learns to become a discoverer and explorer on his own account, and not merely a passive recipient of the results of other people's discoveries.
5. He takes a degree of pleasure in the discoveries or acquisitions made by himself, which he cannot take in those made by others.
6. In teaching himself he proceeds—he can only proceed—in proportion to his strength, and is not perplexed and encumbered by explanations, which, however excellent in themselves, may not be adapted—generally are not adapted—to the actual state of his mind.
7. He consequently proceeds from the known to the unknown.
8. The ideas that he thus gains will, as natural sequences of those already gained by the same method, be clear and precise as far as they go, his knowledge will be accurate, though of course very limited, because it is his own.
9. By teaching himself, and relying on his own powers in a

special case, he acquires the faculty of teaching himself generally—a faculty the value of which can hardly be overrated.

If these principles are involved in the method of self-tuition they necessarily define the measure and limit of the teacher's function, and show us what the art of teaching ought to be. They seem also to render it probable that much that goes under the name of teaching rather hinders than helps the self-teaching of the pupil. The assumption of the pupil's inability to learn except through the manifold explanations of the teacher is inconsistent with this theory, nor less so is the universal practice of making technical definitions, abstract principles, scientific rules, &c., form so large a portion of the pabulum of the youthful mind. The superintending teacher by no means, however, despises definitions, principles, and rules, but he introduces them when the pupil is prepared for them, and then he gets him to frame them for himself. The self-teaching student has no power to anticipate the time when these deductions from facts—for such they all ultimately are—will, by the natural course of mental development, take their proper place in the course of instruction, and any attempt to force him to swallow them merely as intellectual boluses prematurely can only end in derangement of the digestive organs. His mind *can* digest, or at least begin to digest, facts which he sees for himself, but not definitions and rules which he has had no share in making. He cannot, in the nature of things, assume the conclusions of others drawn from facts of which he is ignorant as *his* conclusions, and he is not, therefore, really instructed by passively receiving them.

Those who take a different view from this of teaching sometimes plead that inasmuch as rules and principles are compendious expressions representing many facts, the pupil does in learning them economise time and labour. Experience does not, however, support this view, but it is rather against it. The elementary pupil cannot, if he would, comprehend, for instance, the metaphysical distinctions and definitions of grammar. They are utterly unsuited to his stage of development, and if violently intruded into his mind they cannot be assimilated to its substance, but must remain there as crude, undigested matter, until the system is prepared for them. When that time arrives, he will welcome those compendious generalisations of facts which, when prematurely offered, he rejected with disgust. Stuffing a pupil with ready-made rules and formulæ may perhaps make an adept in cramming, but is cramming the be-all and the end-all of education?

But I must furl my sails and make for land. The idea which I have endeavoured to give of the true relation of the pupil to the teacher, and which represents the former as carrying on his own self-tuition under the wise superintendence of the latter, is of course not new. Nothing strictly new can be said about education. The' elements of it may easily be found in the principles and practice of Ascham, Montaigne, Ratich, Milton, Comenius, Locke, Rousseau, Pestalozzi, Jacotot, and Herbert Spencer. Those who are interested in the subject may find an account of the views and methods of these eminent men in Mr. Quick's valuable little book on Educational Reformers. All, in fact, who have insisted on the great importance of eliciting the pupil's own efforts, and not superseding, enfeebling, and deadening them by too much telling and explaining—all, too, who have urged that abstract rules and principles should, in teaching, follow, not precede, the examples on which they are founded, have virtually adopted the theory which I have endeavoured to state and illustrate. They have, in substance, admitted that the teacher's function is defined by a true conception of the mental operation which we call learning, and that that operation is radically and essentially the work of the pupil, and cannot be performed for him.

If I have succeeded at all in the development of my theory, it must be obvious that a pupil thus trained must be a more accurate observer, a more skilful investigator, more competent to deal with subjects of thought in an intelligent way,—in a word, a more awakened thinker, than one trained in accordance with the opposite theory. The process he goes through naturally tends to make him such, and to prepare him to appreciate and adopt in his subsequent career the methods of science. It is the want of that teaching which comes from himself that makes an ordinary pupil the slave of technicalities and routine, that prevents him from grappling with a common problem of arithmetic or algebra unless he happens to remember the rule, and from demonstrating a geometrical proposition if he forgets the diagram; which even, though he may be a scholar of Eton or Harrow, leaves him destitute of power to deal at sight with a passage of an easy Greek or Latin author. In the great bulk of our teaching, with of course many and notable exceptions, the native powers of the pupil are not made the most of; and hence his knowledge, even on leaving school, is too generally a farrago of facts only partially hatched into principles, mingled in unseemly jumble with rules scarcely at all understood, exceptions claiming equal rank with the rules, definitions dislocated from the objects they define, and technicalities which clog rather than facilitate the operations of the mind.

A slight exercise of our memories, and a slight glance at the actual state of things amongst us, will, I believe, witness to the substantial truth of this statement. If, however, we want other testimony, we may find it in abundance in the Reports and evidence of the four Commissions which have investigated the state of education amongst us; if we want more still, we may be supplied—not, I am sorry to say, to our heart's content, but discontent—in the reports of intelligent official observers from abroad. If we want more still, let us read the petitions only lately presented to the House of Commons from the highest medical authorities, who complain that medical education is rendered abortive and impossible by the wholly unsatisfactory results of middle-class teaching. Does it appear unreasonable to suppose that such a chorus of dispraise and dissatisfaction could not be raised unless there were something in the methods of teaching which naturally leads to the results complained of? If the quality of the teaching—I am not considering the quantity—is not responsible for the quality of its results, I really do not know where we are to find the cause, and failing in detecting the cause, how are we to *begin* even our search for the remedy? Theories of teaching which distrust the pupil's native ability, which in one way or other repress, instead of aiding, the natural development of his mind, which surfeit him with technicalities, which impregnate him with vague infructuous notions that are never brought to the birth, that cultivate the lowest faculties at the expense of the highest, that make him a slave of the Rule-of-Thumb instead of a master of principles—are these theories, which have done much of the mischief, to be still relied on to supply the reform we need? Or shall we find, at least, some of the germs of future life in the other theory, which from the first confides in, cherishes, and encourages the native powers of the child, which takes care that his acquisitions, however small, shall be made by himself, and secures their possession by repetition and natural association, which invests his career with the vivid interest which belongs to that of a discoverer and explorer of unknown lands, which, in short, to adopt the striking words of Burke, instead of serving up to him barren and lifeless truths, leads him to the stock on which they grew, which sets him on the track of invention, and directs him into those paths in which the great authorities he follows made their own discoveries? Is a theory which involves such principles, and leads to such results, worth the consideration of those who regard education as pre-eminently the civilising agent of the world, and lament that England, as a nation, is so little fraught with its spirit?

THE

SCIENCE AND ART OF EDUCATION.

AN INTRODUCTORY LECTURE.

[*Delivered at the College of Preceptors, on the 20th of January*, 1874.]

"Nous avons des maîtres des sciences; nous n'avons pas d'éducateurs, d'hommes qui aient fait leur étude de l'art d'élever les enfants."—*Charles Clavel.*

"Because our understanding cannot, in this body, found itself but on sensible things, nor arrive so clearly to the knowledge of God and things invisible, as by orderly conning over the visible and inferior creature, the same method is necessarily to be followed in all discreet teaching."—MILTON, *Tractate on Education.*

"The aim of Education should be rather to teach us *how* to think, than *what* to think; rather to improve our minds, so as to enable us to think for ourselves, than to load the memory with the thoughts of other men."—DR. BEATTIE.

"C'est dans la nature de l'enfance, dans ses besoins, dans ses aptitudes, dans ses goûts, dans les exigences de la vie qui commence et doit grandir en elle, en un mot, qu'il [the author] cherche les raisons de sa préférence ou de son exclusion pour telle ou telle étude, telle ou telle méthode, tel ou tel régime."—CHARLES CLAVEL, *Œuvres Diverses*, i. 55.

"Instead of second-hand knowledge being regarded as of less value than first-hand knowledge, and as a knowledge to be sought only where first-hand knowledge cannot be had, it is actually regarded as of greater value. . . . Reading is seeing by proxy—is learning indirectly through another man's faculties, instead of directly learning through one's own faculties; and such is the prevailing bias, that the indirect learning is thought preferable to the direct learning, and usurps the name of cultivation!"—HERBERT SPENCER, *The Study of Sociology*, p. 364.

PREFACE.

THE following Lecture was delivered at the College of Preceptors, Queen's Square, Bloomsbury, on the 20th of January last. The chair was taken by the Rev. Dr. Abbott, Head Master of the City of London School. In the course of his remarks at the close of the Lecture, besides expressing his general sympathy with the views I had brought forward, Dr. Abbott also expressed his opinion that there was a certain degree of novelty in the plan by which it was proposed that the Science of Education, with its correlative Art, should be studied by teachers. I have therefore thought it worth while, by the publication of the Lecture, to give those who are interested in Education generally, and Teachers especially, an opportunity of forming their own judgment on the value of my theory; and in order to furnish them with some idea of the nature and scope of the "Training Course of Lectures and Lessons on the Science, Art, and History of Education," which I delivered last year, and am repeating at the present time, I subjoin the "Syllabus."

"The object of the entire course is to show that there are Principles of Education, on which, in order to be truly efficient, Practice must be founded; or, in other words, that there is a Science of Education, in reference to which the Art must be conducted, and the value of its processes tested.

"In the First Division of the Course, the Science of Education will be built up on an investigation into the nature of the being to be educated, and into the phenomena which indicate and result in bodily, intellectual, and moral growth. This investigation involves an analysis of the organic life of the child, beginning with his earliest manifestations of Feeling, Will, and Intellect. Such manifestations are the result of external agencies which develop the child's native powers. This development constitutes his natural education, which, as being carried on without formal means and appliances, resolves itself into self-education. The principles underlying the processes by which the child is stimulated to educate himself constitute the Science of Natural Education, which is, therefore, the model or type of Formal Education.

"In the Second Division of the Course, the application of the principles, or Science, to the practice or Art of Education, will be treated, the difficulties in the way of their strict application considered, and suggestions offered for meeting them. The educator will be shown to be an artist accomplishing his end through scientific means. The ordinary methods of general education, and those of teaching different subjects, will be critically examined, and the principles involved in them subjected to the test of the Science of Education.

"In the Third Division of the Course, a sketch of the History of Education from the earliest times, and among different nations, will be given. With this will be connected a detailed account of the Theories and Methods of the most eminent Writers on Education and Teachers in all ages—Aristotle, Plato, Quintilian, Erasmus, the Jesuits, Ascham, Ratich, Comenius, Locke, Rousseau, Basedow, Pestalozzi, De Fellenberg, Jacotot, Fröbel, Arnold, Herbert Spencer, &c.,—and the conformity or disagreement of their Theories and Methods with the Scientific Principles of Education examined and appreciated."

JOSEPH PAYNE.

4, Kildare Gardens, W.
Feb. 18*th*, 1874.

THE SCIENCE AND ART OF EDUCATION.

AT the beginning of last year I delivered, in this room, a lecture intended to inaugurate the Course of Lectures and Lessons on the Science and Art of Education, which the Council of the College of Preceptors had appointed me to undertake. The experiment then about to be tried was a new one in this country; for, although we have had for some years Colleges intended to prepare Elementary Teachers for their work, nothing of the kind existed for Middle Class and Higher Teachers. As I stated in that Inaugural Lecture, the Council of the College of Preceptors, after waiting in vain for action on the part of the Government or of the Universities, and attempting, also in vain, to obtain the influential co-operation of the leading scholastic authorities in aid of their object,* resolved to make a beginning themselves. They therefore adopted a scheme laid before them by one of their colleagues—a lady—and offered the first Professorship of the Science and Art of Education to me.

We felt that some considerable difficulties lay in the way of any attempt to realise our intentions. Among these there were two especially on which I will dwell for a few minutes. The first was the opinion, very generally entertained in this country, that there is no Science of Education, that is, that there are no fixed principles for the guidance of the Educator's practice. It is generally admitted that there is a Science of Medicine, of Law, of Theology; but it is *not* generally admitted that there is a corresponding Science of Education. The opinion that there is no such Science was, as we know, courageously uttered by Mr. Lowe; but we also know that there are hundreds of cultivated professional men in England who silently maintain it, and are practically guided by it. These men, many of them distinguished proficients in the

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* It is pleasant to record the interesting fact, that at the last meeting of the Head Masters' Committee, not only was the principle of a special professional training for teachers theoretically admitted, but steps taken for realising it. The effective execution of this design will, of course, involve a study of the Science as well as the Art of Education.

Art of teaching, if you venture to suggest to them that there must be a correlated *Science* which determines—whether they are conscious of it or not—the laws of their practice, generally by a significant smile let you know their opinion both of the subject and of yourself. If they deign to open their lips at all, it is to mutter something about "Pedagogy," "frothy stuff," "mere quackery,"* or to tell you point-blank that if there is such a Science it is no business of theirs: they do very well without it. This opinion, which they, no doubt, sincerely entertain, is, however, simply the product of thoughtlessness on their part. If they had carefully considered the subject in relation to themselves—if they had known the fact that the Science which they disclaim or denounce has long engaged the attention of hundreds of the profoundest thinkers of Germany—many of them teachers of at least equal standing to their own—who have reverently admitted its pretensions, and devoted their great powers of mind to the investigation of its laws, they would, at least, have given you a respectful hearing. But great, as we know, is the power of ignorance, and it will prevail—for a time. There are, however, even now, hopeful signs which indicate a change of public opinion. Only a week ago, a leader in the *Times* called attention to Sir Bartle Frere's conviction, expressed in one of his lectures in Scotland, that "the acknowledged and growing power of Germany is intimately connected with the admirable education which the great body of the German nation are in the habit of receiving." The education of which Sir Bartle Frere thus speaks is the direct result of that very science which is so generally unknown, and despised, because unknown, by our cultivated men, and especially by many of our most eminent teachers. When this educated power of Germany, which has already shaken to its centre the boasted military reputation of France, does the same for our boasted commercial reputation, as Sir Bartle Frere and others declare that it is even now doing, and for our boasted engineering reputation, as Mr. Mundella predicts it will do, unless we look about us in time, the despisers of the Science of Education will adopt a different tone, and perhaps confess themselves in error, at all events, they will betake themselves to a modest and respectful silence. No later back than yesterday (January 19) the *Times* contained three letters bearing on Sir Bartle Frere's assertion that the increasing commercial importance of Germany is due mainly to the excellence of German education. One writer refers to the German *Realschulen*, or Thing-Schools, and to the High Schools of Commerce, in both of which the practical study of matters bearing on real life is conducted. Another writer, an ex-Chairman of the Liverpool Chamber of Commerce, says: "I have no hesitation in stating that young Germans make the best business men, and the reason is, that they are usually better educated; I mean by this, they have a more thorough education, which imparts to them accuracy and precision. Whatever they do is well and accurately done; no detail is too small to escape their attention, and this engenders a habit of thought and mind, which in after life makes them shrewd and thorough men of business. I think the maintenance of our commercial superiority is very much of a schoolmaster's question." A third writer speaks of the young German clerks sent out to the East as "infinitely superior" in education to the class of young men sent out from England, and ends by saying, "Whatever be the cause, there can be no question that the Germans are outstripping us in the race for commercial superiority in the far East."

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* It is remarkable that the dictionary meaning of "quack" is "a boastful pretender to arts he does not understand," so that the asserter of principles as the foundation of correct practice is ignorantly denounced as weak on the very point which constitutes his strength. One may imagine the shouts of laughter with which such a denunciation would be received in an assembly of German experts in education.

Some persons, no doubt, will be found to cavil at these statements; the only comment, however, I think it necessary to make is this—"Germany is a country where the Science of Education is widely and profoundly studied, and where the art is conformed to the Science." I leave you to draw your own inferences. Without, however, dwelling further on this important matter, though it is intimately connected with my purpose, I repeat that this dead weight of ignorance in the public mind respecting the true claims of the Science of Education constitutes one of the difficulties with which we have had to contend. The writer of a leading article in the *Times*, January 10, said emphatically, "In truth, there is nothing in which the mass of Englishmen are so much in need of education as in appreciating the value of education itself." These words contain a pregnant and melancholy truth, which will be more and more acknowledged as time moves on.

But there was another difficulty of scarcely less importance with which we had to contend, and this is the conviction entertained by the general body of teachers that they have nothing to learn about education. We are now descending, be it remembered, from the leaders to the great band of mere followers, from the officers of the army to the rank and file. My own experience, it may well be believed, of teachers has been considerable. As the net result of it, I can confidently affirm that until I commenced my class in February last, I never came in contact with a dozen teachers who were not entirely satisfied with their own empirical methods of teaching. To what others had written on the principles of Education,—to what these had reduced to successful practice,—they were, for the most part, profoundly indifferent. To move onward in the grooves to which they had been accustomed in their school days, or, if more intelligent, to devise methods of their own, without any respect to the experience, however enlightened, of others, was, and is, the general practice among teachers. For them, indeed, the great educational authorities, whether writers or workers, might as well never have existed at all. In short, to repeat what I said before, teachers, as a class (there are many notable exceptions), are so contented with themselves and their own methods of teaching that they complacently believe, and act on the belief, that they have nothing at all to learn from the Science and Art of Education; and this is much to be regretted for their own sakes, and especially for the sake of their pupils, whose educational health and well-being lie in their hands. However this may be, the fact is unquestionable, that one of the greatest impediments to any attempt to expound the principles of Education lies in the unwarrantable assumption on the part of the teachers that they have nothing to learn on the subject. Here, however, as is often the case, the real need for a remedy is in inverse proportion to the patient's consciousness of the need. The worst teachers are generally those who are most satisfied with themselves, and their own small performances.

The fallacy, not yet displaced from the mind of the public, on which this superstructure of conceit is raised, is that "he who knows a subject can teach it." The postulate, that a teacher should thoroughly know the subject he professes to teach, is by no means disputed, but it is contended that the question at issue is to be mainly decided by considerations lying on the pupil's side of it. The process of thinking, by which the pupil learns, is essentially his own. The teacher can but stimulate and direct; he cannot supersede it. He cannot do the thinking necessary to gain the desired result for his pupil. The problem, then, that he has to solve is, how to get his pupil to learn; and it is evident that he may know the subject without knowing the best means of making his pupil know it too, which is the assumed end of all his teaching. He may be an adept in his subject, but a novice in the art of teaching it—an art which has principles, laws, and processes peculiar to itself.

But, again; a man, profoundly acquainted with a subject, may be unapt to teach it by reason of the very height and extent of his knowledge. His mind habitually dwells among the mountains, and he has, therefore, small sympathy with the toiling plodders on the plains below. The difficulties which beset their path have long ceased to be a part of his own experience. He cannot then easily condescend to their condition, place himself alongside of them, and force a sympathy he cannot naturally feel with their trials and perplexities. Both these cases tend to the same issue, and show that it is a fallacy to assert that there is any necessary connection between knowing a subject and knowing how to teach it.

Our experiment was commenced on the 6th of February last On the afternoon of that day, only seventeen teachers had given in their names as members of the class that was to be formed. In the evening, however, to my surprise, I found no fewer than fifty-one awaiting the lecture. This number was increased in a few weeks to seventy, and on the whole, there have been eighty members in the course of the year. Having brought our little history down to the commencement of the lectures in 1873, I propose to occupy the remainder of our time with a brief account of what was intended, and what has been accomplished by them.

Generally speaking, the intention was to show (1) that there is a Science of Education, that is, that there are principles derived from the nature of the mind which furnish laws for the educator's guidance; (2) that there is an Art founded on the Science, which will be efficient or inefficient in proportion to the educator's conscious knowledge of its principles.

It will be, perhaps, remembered by some now present, that I gave in my Inaugural Lecture a sketch of the manner in which I intended to treat these subjects. As, however, memories are often weak, and require to be humoured, and as repetition is the teacher's sheet-anchor, I may, perhaps, be excused if I repeat some of the matter then brought forward, and more especially as I may calculate that a large proportion of my audience were not present last year.

I had to consider how I should treat the Science of Education, especially in relation to such a class as I was likely to have. It was to be expected that the class would consist of young teachers unskilled in the art of teaching, and perhaps even more unskilled in that of thinking. Such in fact they, for the most part, proved to be. Now the Science of Education is a branch of Psychology, and both Education and Psychology, as sciences, may be studied either deductively or inductively. We may commence with general propositions, and work downward to the facts they represent, or upward from the facts to the general propositions. To students who had been mainly occupied with the concrete and practical, it seemed to me much better to commence with the concrete and practical; with facts, rather than with abstractions. But what facts? That was the question. There is no doubt that a given art contains in its practice, for eyes that can truly see, the principles which govern its action. The reason for doing may be gathered from the doing itself. If, then, we could be quite sure beforehand that perfect specimens of practical teaching, based on sound principles, were accessible, we might have set about studying them carefully, with a view to elicit the principles which underlie the practice, and in this way we might have arrived at a Science of Education. But then this involves the whole question—Who is to guarantee dogmatically the absolute soundness of a given method of teaching, and if any one comes forward to do this, who is to guarantee the soundness of his judgment? It appears, then, that although we might evolve the principles of medicine from the general practice of medicine, or the principles of engineering from the general practice of engineering, we cannot evolve the principles of education from the general practice of education as we actually find it. So much of that practice is radically and obviously unsound, so little of sequence and co-ordination is there in its parts, so aimless generally is its action, that to search for the Science of Education in its ordinary present practice would be a sheer waste of time. We should find, for instance, the same teacher acting one day, and with regard to one subject, on one principle, and another day, or with regard to another subject, on a totally different principle, all the time forgetting that the mind really has but one method of learning so as really to know, though multitudes of methods may be framed for giving the semblance of knowing. We see one teacher, who is never satisfied until he secures his pupil's possession of clear ideas upon a given subject; another, who will let them go off with confused and imperfect ideas; and a third, who will think his duty done when he has stuffed them with mere words—with husks instead of grain.

It is then perfectly clear that we cannot deduce the principles of true science from varying practice of this kind; and if we confine ourselves to inferences drawn from such practice, we shall never know what the Science of Education is. Having thus shut ourselves off from dealing with the subject by the high *à priori* method, commencing with abstract principles, and also from the unsatisfactory method of inference founded on various, but generally imperfect, practice; and being still resolved, if possible, to get down to a solid foundation on which we might build a fabric of science, we were led to inquire whether *any* system of education is to be found, constant and consistent in its working, by the study of which we might reach the desired end. On looking round we saw that there *is* such a system continually at work under our very eyes,—one which secures definite results, in the shape of positive knowledge, and trains to habit the powers by which these results are gained,—which cannot but be consistent with the general nature of things, because it is *Nature's own.* Here, then, we have what we were seeking for—a system working harmoniously and consistently towards a definite end, and securing positive results—a system, too, strictly educational, whether we regard the development of the faculties employed, or the acquisition of knowledge, as accompanying the development—a system in which the little child is the pupil and Nature the educator.

Having gained this stand-point, and with it a conviction that if we could only understand this great educator's method of teaching, and see the true connection between the means he employs and the end he attains, we should get a correct notion of what is really meant by education; we next inquire, "How are we to proceed for this purpose?" The answer is, by the method through which other truths are ascertained—by investigation. We must do what the chemist, the physician, the astronomer do, when they study their respective subjects. We must examine into the facts, and endeavour to ascertain, first, what they are; secondly, what they mean. The bodily growth of the child from birth is, for instance, a fact, which we can all observe for ourselves. What does it mean? It means that, under certain external influences—such as air, light, food—the child increases in material bulk and in physical power; that these influences tend to integration, to the forming of a whole; that they are all necessary for that purpose; that the withholding of any one of them leads to disintegration or the breaking up of the whole. But as we continue to observe, we see, moreover, evidences of mental growth. We witness the birth of consciousness; we see the mind answering, through the senses, to the call of the external world, and giving manifest tokens that impressions are both received and retained by it. The child "takes notice" of objects and actions, manifests feelings of pleasure or pain in connection with them, and indicates a desire or will to deal in his own way with the objects, and to take part in the actions. We see that this growth of intellectual power, shown by his increasing ability to hold intercourse with things about him, is closely connected with the growth of his bodily powers, and we derive from our observation one important principle of the Science of Education, that *mind and body are mutually interdependent, and co-operate in promoting growth.*

We next observe that as the baby, under the combined influences of air, light, and food, gains bodily strength, he augments that strength by continually exercising it; he uses the fund he has obtained, and, by using, makes it more. Exercise reiterated, almost unremitting; unceasing movement, apparently for its own sake, as an end in itself; the jerking and wriggling in the mother's arms, the putting forth of his hands to grasp at things near him, the turning of the head to look at bright objects; this exercise, these movements, constitute his very life. He lives in them, and by them. He is urged to exercise by stimulants from without; but the exercise itself brings pleasure with it (*labor ipse voluptas*), is continued on that account, and ends in increase of power. What applies to the body applies also, by the foregoing principle, to the intellectual powers, which grow with the infant's growth, and strengthen with his strength. Our observation of these facts furnishes us, therefore, with a second principle of education—*Faculty of whatever kind grows by exercise.* Without changing our ground we supplement this principle by another. We see that the great educator who prompts the baby to exercise, and connects pleasure with all his voluntary movements, makes the exercise effectual for the purpose in view by constant reiteration. Perfection in action is secured by repeating the action thousands of times. The baby makes the same movements over and over again; the muscles and the nerves learn to work together, and habit is the result. Similarly in the case of the mind, the impressions communicated through the organs of sense grow from cloudy to clear, from obscure to definite, by dint of endless repetition of the functional act. By the observation of these facts we arrive at a third principle of education:—*Exercise involves repetition, which as regards bodily actions ends in habits of* *action, and as regards impressions received by the mind, ends in clearness of perception.*

Looking still at our baby as he pursues his education, we see that this manifold exercise is only apparently an end in itself. The true purpose of the teaching is to stimulate the pupil to the acquisition of knowledge, and to make all these varied movements subservient to that end. This exercise of faculty brings the child into contact with the properties of matter, initiates him into the mysteries of hard and soft, heavy and light, &c., the varieties of form, of round and flat, circular and angular, &c., the attractive charms of colour. All this is knowledge gained by reiterated exercise of the faculties, and stored up in the mind by its retentive power. We recognise the baby as a practical inquirer after knowledge for its own sake. But we further see him as a discoverer, testing the properties of matter by making his own experiments upon it. He knocks the spoon against the basin which contains his food; he is pleased with the sound produced by his action, and more than pleased, delighted, if the basin breaks under the operation. He throws his ball on the ground, and follows its revolution with his enraptured eye. What a wonderful experiment it is! How charmed he is with the effect he has produced! He repeats the experiment over and over again with unwearied assiduity. The child is surely a Newton or a Faraday, in petticoats. No, he is simply one of nature's ordinary pupils, inquiring after knowledge, and gaining it by his own unaided powers. He is teaching himself, under the guidance of a great educator. His self-teaching ends in development and growth, and it is therefore strictly educational in its nature. In view of these facts we gain a fourth principle of the Science of Education. *The exercise of the child's own powers, stimulated but not superseded by the educator's interference, ends both in the acquisition of knowledge and in the invigoration of the powers for further acquisition.*

It is unnecessary to give further illustrations of our method. Every one will see that it consists essentially in the observation and investigation of facts, the most important of which is that we have before us a pupil going through a definite system of education. We are convinced that it is education, because it develops faculty, and therefore conduces to development and growth. By close observation we detect the method of the master, and see that it is a method which repudiates cramming rules and definitions, and giving wordy explanations, and secures the pupil's utmost benefit from the work by making him do it all himself through the exercise of his unaided powers.* We thus get a clue to the construction of a Science of Education, to be built up, as it were, on the organised compound of body and mind, to which we give the name of baby. Continuing still our observation of the phenomena it manifests, first, in its speechless, and afterwards in its speaking condition, we gain other principles of education; and lastly, colligating and generalising our generalisations, we arrive at a definition of education as carried on by Nature. This may be roughly expressed thus:—*Natural education consists in the development and training of the learner's powers, through influences of various kinds, which are initiated by action from without, met by corresponding reaction from within.*

Then assuming, as we appear to have a right to do, that this natural education should be the model or type of formal education, we somewhat modify our definition thus—

Education is the development and training of the learner's native powers by means of instruction carried on through the conscious and persistent agency of the formal educator, and depends upon the established connection between the world without and the world within the mind—between the objective and subjective.

I am aware that this definition is defective, inasmuch as it ignores—or appears to ignore—the vast fields of physical and moral education. It will, however, serve my present purpose, which is especially connected with intellectual education.

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* The Bishop of Exeter, in the admirable address which he lately delivered on the occasion of his presiding at the giving of prizes to the successful candidates for schools in union with the College of Preceptors, confirmed in various ways the principle above laid down. This address was delivered since my lecture at the College. It may be found fully reported in the "Educational Times" for February. Among other remarks were the following:—"We often find that when teachers fancy their pupils have obtained a thorough mastery of a subject, they are deceived, because they have not noticed that, in almost imperceptible ways, they have been doing for the pupil what he ought to be doing for himself. I have repeatedly gone into a school, and on examining it, say in arithmetic, have been told by the master, 'It is very strange that the boys do not know it; I thought they knew it thoroughly.' I have always asked them this, 'When you have examined them, have you made them answer for themselves?' And the reply has been, 'Yes; I have left them with themselves except just the very slightest possible help occasionally; just enough to prevent them from wandering about.' That is the whole thing. That very little help is the thing which vitiated the examination altogether; and the test of real mastery is that the knowledge shall be produced [and therefore obtained] without any help at all. When a man or woman in after-life come to use their knowledge, they will find that the knowledge is really of no use unless they are able to apply it absolutely without assistance, and without the slightest guidance to prevent them falling into the most grievous mistakes."

Having reached this point, and gained a general notion of a Science of Education, we go on to consider the Art of Education, or the practical application of the Science. We are thus led to examine the difference between Science and Art, and between Nature and Art. Science tells us what a thing is, and why it is what it is. It deals therefore with the nature of the thing, with its relations to other things, and consequently with the laws of its being. Art derives its rule from this knowledge of the thing and its laws of action, and says, "Do this or that with the thing in order to accomplish the end you have in view. If you act otherwise with it you violate the laws of its being." Now the rules of Art may be carried out blindly or intelligently. If blindly, the worker is a mere artisan—an operative who follows routine, whose rule is the rule-of-thumb. If intelligently, he is a true artist, who not only knows what he is doing, but why this process is right and that wrong, and who is furnished with resources suitable for guiding normal and correcting abnormal action. All the operations of the true artist can be justified by reference to the principles of Science. But there is also a correlation between Nature and Art. These terms are apparently, but not really, opposed to each other. Bacon long ago pointed out the true distinction when he said, *Ars est Homo additus Naturæ*—Art is Nature with the addition of Man—Art is Man's work added to (not put in the place of) Nature's work. Here then is the synthesis of Nature and Man which justifies us in saying that natural education is the type or model of formal, or what we usually call, without an epithet, education, and that the Art of Teaching is the application by the teacher of laws of Science, which he has himself discovered by investigating Nature. This is the keystone of our position; if this is firm and strong, all is firm and strong. Abandon this position and you walk in darkness and doubt, not knowing what you are doing or whither you are wandering—at the mercy of every wind of doctrine.

The artist in education, thus equipped, is ready not only to work himself, but to judge of the work of others. He sees, for instance, a teacher coldly or sternly demanding the attention of a little child to some lesson, say in arithmetic. The child has never been led up gradually to the point at which he is. He has none but confused notions about it. The teacher, without any attempt to interest the child, without exhibiting affection or sympathy towards him, hastily gives him some technical directions, and sends him away to profit by them as he may—simply "orders him to learn," and leaves him to do so alone. Our teacher says,—"This transaction is inartistic. The element of humanity is altogether wanting in it. It is not in accordance with the Science of Education; it is a violation of the Art. The great educator, in his teaching, presents a motive and an object for voluntary action; and therefore excites attention towards the object by enlisting the feelings in the inquiry. He does not, it is true, show sympathy, because he acts by inflexible rules. But the human educator, as an artist, is bound not only to excite an interest in the work, but to sympathise with the worker. This teacher does neither. His practice ought to exemplify the formula, *Ars* = *Natura* + *Homo*. He leaves out both *Natura* and *Homo*. His *Ars* therefore = 0."

Another case presents itself. Here the teacher does not leave the child alone; on the contrary, is continually by his side. At this moment he is copiously "imparting his knowledge" of some subject to his pupil, whose aspect shows that he is not receiving it, and who therefore looks puzzled. The matter, whatever it is, has evidently little or no relation to the actual condition of the child's mind, in which it finds no links of association and produces no intellectual reaction, and which therefore does not co-operate with the teacher's. He patiently endures, however, because he cannot escape from it, the downpouring of the teacher's knowledge; but it is obvious that he gains nothing from it. It passes over his mind as water passes over a duck's back. The subject of instruction, before unknown, remains unknown still. Our artist teacher, looking on, pronounces that this teaching is inartistic, as not being founded on Science. "The efficiency of a lesson is to be proved," he says, "by the part taken in it by the pupil; and here the teacher does all the work, the pupil does nothing at all. It is the teacher's mind, not the learner's, that is engaged in it. Our great master teaches by calling into exercise the *learner's* powers, not by making a display of his own. The child will never learn anything so as to possess it for himself by such teaching as this, which accounts the exercise of his own faculties as having little or nothing to do with the process of learning."

Once more; our student, informed in the Science of Education, watches a teacher who is giving a lesson on language—say, on the mother tongue. This mother tongue the child virtually knows how to use already: and if he has been accustomed to educated society, speaks and (if he is old enough to write) writes it correctly. The teacher puts a book into his hand, the first sentence of which is "English grammar is the art of speaking and writing the English language correctly." The child does not know what an "art" is, nor what is meant by speaking English "correctly." If he is intelligent he wonders whether he speaks it "correctly" or not. As to the meaning of "art," he is altogether at sea. The teacher is aware of the perplexity, and desiring to make him really understand the meaning of the word, attempts an explanation. "An art," he says (getting the definition from a dictionary), "is a power of doing something not taught by Nature." The child stares with astonishment, as if you were talking Greek or Arabic. What can be meant by a "power"—what by "being taught by Nature?" The teacher sees that his explanation has only made what was dark before darker still. He attempts to explain his explanation, and the fog grows thicker and thicker. At last he gives it up, pronounces the child stupid, and ends by telling him to learn by rote—that is, by hurdy-gurdy grind—the unintelligible words. *That* at least the child can do (a parrot could be taught to do the same), and he does it; but his mind has received no instruction whatever from the lesson—the intelligence which distinguishes the child from the parrot remains entirely uncultivated.

Our teacher proceeds to criticise. "This is," he says, "altogether inartistic teaching. Our great master does not begin with definitions—and indeed gives no definitions—because they are unsuited to his pupil's state of mind. He begins with facts which the child can understand, because he observes them himself. This teacher should have begun with facts. The first lesson in Grammar (if indeed it is necessary to teach Grammar at all to a little child) should be a lesson on the *names* of the *objects* in the room—objects which the child sees and handles, and knows by seeing and handling—that is, has ideas of them in his mind. 'What is the name of this thing and of that?' he inquires, and the child tells him. The ideas of the things, and the names by which they are known, are already associated together in his consciousness, and he has already learned to translate things into words. The teacher may tell him (for he could not discover it for himself) that a *name* may also be called a *noun*. 'What then,' the teacher may say, 'is a noun?' The child replies, '*A noun is the name of a thing.*' He has constructed a definition himself—a very simple one certainly—but then it is a definition which he thoroughly understands because it is his own work. This mode of proceeding would be artistic, because in accordance with Nature. There would be no need to commit the definition to memory, as a mere collection of words, because what it means is already committed to the understanding, which will retain it, because it represents facts already known and appreciated. Thoroughly *knowing* things is the sure way to *remember* them."

In some such way as this our expert brings the processes commonly called teaching to the touchstone of his Science, the Science which he has built up on his observation of the processes of Nature.

I am afraid that, in spite of my illustrations, I may still have failed to impress you as strongly as I wish to do with the cardinal truth, that you cannot get the best results of teaching unless you understand the mind with which you have to deal. There are, indeed, teachers endowed with the power of sympathising so earnestly with children, that in their case this sympathy does the work of knowledge, or rather it is knowledge unconsciously exercising the power proverbially attributed to it. The intense interest they feel in their work almost instinctively leads them to adopt the right way of doing it. They are artists without knowing that they are artists. But, speaking generally, it will be found that the only truly efficient director of intellectual action is one who understands intellectual action—that is, who understands the true nature of the mind which he is directing. It is this demand which we make on the teacher that constitutes teaching a pyschological art, and which renders the conviction inevitable that an immense number of those who practise it do so without possessing the requisite qualifications. They undertake to guide a machine of exquisite capabilities, and of the most delicate construction, without understanding its construction or the range of its capabilities, and especially without understanding the fundamental principles of the science of mechanics. Hence the telling, cramming, the endless explaining, the rote-learning, which enfeeble and deaden the native powers of the child; and hence, as the final consequence, the melancholy results of instruction in our primary schools, and the scarcely less melancholy results in schools of higher aims and pretensions, all of which are the legitimate fruit of the one fundamental error which I have over and over again pointed out.

In accordance with these views, it has been insisted on through out the entire Course of Lectures, that teaching, in the true sense of the term, has nothing in common with the system of telling, cramming, and drilling, which very generally usurps its name. The teacher, properly so called, is a man who, besides knowing the subject he has to teach, knows moreover the nature of the mind which he has to direct in its acquisition of knowledge, and the best methods by which this may be accomplished. He must know the subject of instruction thoroughly, because, although it is not he but the child who is to learn, his knowledge will enable him to suggest the points to which the learner's attention is to be directed; and besides, as his proper function is to act as a guide, it is important that he should have previously taken the journey himself. But we discountenance the notion usually entertained that the teacher is to know *because* he has to *communicate his knowledge* to the learner; and maintain, on the contrary, that his proper function as a teacher does *not* consist in the communication of his own knowledge to the learner, but rather in such action as ends in the learner's acquisition of knowledge for himself. To deny this principle is to give a direct sanction to telling and cramming, which are forbidden by the laws of education. To tell the child what he can learn for himself is to neutralise his efforts; consequently to enfeeble his powers, to quench his interest in the subject, probably to create a distaste for it, to prevent him from learning how to learn—to defeat, in short, all the ends of true education. On the other hand, to get him to gain knowledge for himself stimulates his efforts, strengthens his powers, quickens his interest in the subject, and makes him take pleasure in learning it, teaches him how to learn other subjects, leads to the formation of habits of thinking; and, in short, promotes all the ends of true education. The obvious objection to this view of the case is, that as there are many things which the child cannot learn by himself, we must of course tell him them. My answer is, that the things which he cannot learn of himself are thing unsuited to the actual state of his mind. His mind is not yet prepared for them; and by forcing them upon him prematurely, you are injuriously anticipating the natural course of things. You are cramming him with that which, although it may be knowledge to you, cannot possibly be knowledge to him. Knowing, in relation to the training of the mind, is the result of learning; and learning is the process by which the child teaches himself; and he teaches himself—he can only teach himself—by personal experience. Take, for instance, a portion of matter which, for some cause or other, interests him, He exercises his senses upon it, looks at it, handles it, &c., throws it on the ground, flings it up into the air; and, while doing all this, compares it with other things, gains notions of its colour, form, hardness, weight, &c. The result is, that without any direct teaching from you, without any *telling*, he knows it through his personal experience—he knows it, as we say, of his own knowledge; and has not only learned by himself something that he did not know before, but has been learning how to learn. But supposing that you are not satisfied with his proceeding thus naturally and surely in the career of self-acquisition, and you tell him something which he could not possibly learn by this method of his own. Let it be, for instance, the distance of the sun from the earth, the superficial area of Sweden, &c. When you have told him that the sun is 95 millions of miles from the earth, that the area of Sweden is so many square miles, you have evidently transcended his personal experience. What you have told him, instead of being knowledge gained, as in the other case, at first hand, is information obtained probably at tenth or even fiftieth hand, even by yourself, and is therefore in no true sense of the word "knowledge" even to you, much less is it knowledge to him; and in telling it to him prematurely you are cramming and not teaching him. Dr. John Brown ("Horæ Subsecivæ," second series, p. 473) well says,—"The great thing with knowledge and the young is to secure that it shall be their own; that it be not merely external to their inner and real self, but shall go *in succum et sanguinem;* and therefore it is that the self-teaching that a baby and a child give themselves remains with them for ever. It is of their essence, whereas what is given them *ab extra*, especially if it be received mechanically, without relish, and without any energising of the entire nature, remains pitifully useless and *wersh* (insipid). Try, therefore, always to get the resident teacher *inside the skin*, and who is for ever giving his lessons, to help you, and be on your side." You easily see from these remarks of Dr. Brown's that he means what I mean;—that matters of information obtained by other people's research, and which is true knowledge to those who have lawfully gained it, is not knowledge to a child who has had no share in the acquisition, and your dogmatic imposition of it upon his mind, or rather memory only, is of the essence of cramming. Such information is merely patchwork laid over the substance of the cloth as compared with the texture of the cloth itself. It is *on*, but not *of*, the fabric. This expansive and comprehensive principle—which regards all learning by mere rote, even of such matters as multiplication-table or Latin declensions—before the child's mind has had some preliminary dealing with the facts of Number or of Latin —as essentially cramming, and therefore anti-educational in its nature—will be, of course, received or rejected by teachers, just in proportion as they receive or reject the conception of an art of teaching founded on psychological principles.

And this brings me to the next point for special consideration. I said that the teacher who is to direct intellectual operations should understand what they are. He should, especially as a teacher of little children, examine well the method, already referred to, by which they gain all their elementary knowledge by themselves, by the exercise of their own powers. He should study children in the concrete,—take note of the causes which operate on the will, which enlist the feelings, which call forth the intellect,—in order that he may use his knowledge with the best effect when he takes the place of the great natural educator. To change slightly Locke's words, he is to "consider the operation of the discerning faculties of a child as they are employed about the objects which they have to do with;" and this because it is his proper function as a teacher to guide this operation. And if he wishes to be an accomplished teacher—a master of his art—he should further study the principles of Psychology, the true groundwork of his action, in the writings of Locke, Dugald Stewart, Bain, Mill, and others, who show us what these principles are. This study will give a scientific compactness and co-ordination to the facts which he has learned by his own method of investigation.

But it may be said, Do you demand all this preparation for the equipment of a mere elementary teacher? My reply is, I require it because he *is* an elementary teacher. Whatever may be done in the case of those children who are somewhat advanced in their career, and who have, to some extent at least, learnt how to learn, it is most of all important that in the beginning of instruction, and with a view to gain the most fruitful results from that instruction, the earliest teacher should be an adept in the Science and Art of Education. We should do as the Jesuits did in their famous schools, who, when they found a teacher showing real skill and knowledge in teaching the higher classes, *promoted* him to the charge of the lowest. There was a wise insight into human nature in this. Whether the child shall love or hate knowledge,—whether his fundamental notions of things shall be clear or cloudy, —whether he shall advance in his course as an intelligent being, or as a mere machine,—whether he shall, at last, leave school stuffed with crude, undigested gobbets of knowledge, or possessed of knowledge assimilated by his own digestion, and therefore a source of mental health and strength, — whether he shall be lean, atrophied, weak, destitute of the power of self-government and self-direction, or strong, robust, and independent in thought and action,—depends almost altogether on the manner in which his earliest instruction is conducted, and this again on the teacher's acquaintance with the Science and Art of Education.

But besides knowing the subject of instruction, and knowing the Art of Education founded on the Science, the accomplished teacher should also know the methods of teaching devised or adopted by the most eminent practitioners of his art. A teacher, even when equipped in the manner I have suggested, cannot safely dispense with the experience of others. In applying principles to practice there is always a better or a worse manner of doing so, and one may learn much from knowing how others have overcome the difficulties at which we stumble. Many a teacher, when doubtful of the principles which constitute his usual rule of action, will gain confidence and strength by seeing their operation in the practice of others, or may be reminded of them when he has for the moment lost sight of them. Is it nothing to a teacher that Plato, Aristotle, Plutarch, Quintilian, in ancient times; Ascham, Rousseau, Comenius, Sturm, Pestalozzi, Ratich, Jacotot, Fröbel, Richter, Herbart, Beneke, Diesterweg, Arnold, Spencer, and a host of others in modern times, have written and worked to show him what education is both in theory and practice? Does he evince anything but his own ignorance by pretending to despise or ignore their labours? What would be said of a medical practitioner who knows nothing of the works or even the names of Celsus, Galen, Harvey, John Hunter, Sydenham, Bell, &c., and who sets up his empirical practice against the vast weight of their authority and experience? I need not insist on this argument: it is too obvious. Much time, therefore, has been devoted, during the year, to the History of Education in various countries and ages, and to the special work of some of the great educational reformers. In particular, the methods of Ascham, Ratich, Comenius, Pestalozzi, Jacotot, and Fröbel have been minutely described and criticised.

And now it is only right to endeavour, in conclusion, to answer the question which may be fairly asked, "After all, what have you really accomplished by this elaborate exposition of principles and methods? You have had no training schools for the practice of your students; it has all ended in talk." In reply to this inquiry or objection, I have a few words to say. The students whom I have been instructing are for the most part teachers already, who are practising their art every day. My object has been so forcibly to stamp upon their minds a few great principles, so strongly to impress them with convictions of the truth of these principles, that it should be impossible, in the nature of things, for them as my disciples, to act in contradiction or violation of them. Whenever, in their practice, they are tempted to resort to drill and cram, I know, without being there to see, that the principles which have become a part of their being, because founded on the truths of nature recognised by themselves, rise up before them and forbid the intended delinquency. In this way, without the apparatus of a training school, the work of a training school is done.

But, in order to show that I am not talking at random, I will quote a few passages from exercises written by the students themselves, relative to their own experience.

"Before attending these Lectures, my aim was that my pupils should gain a certain amount of knowledge. I now see how far more important is the exercise of those powers by which knowledge is gained. I am therefore trying to make them think for themselves. This, and the principle of repetition, which has been so much insisted upon, prevents us from getting over as much ground as formerly, but I feel that the work done is much more satisfactory than it used to be. I now try to adapt my plan to the pupil, not the pupil to my plan. I used to prepare a lesson (say in history) with great care; all the information which I thus laboriously gained I imparted to my pupils in a few minutes. I now see that, though I was benefited by the process, my pupils could have gained but little good from it. The fact of having a definite end in view gives me confidence in my practice. The effect of these Lectures, as a whole, has been to give me a new interest in my work."

"I knew before that the ordinary 'learn by rote' method was not real education; but being unacquainted with the Science upon which the true art of instruction is founded, all my ideas on the subject were vague and changeable, and I often missed the very definite results of the 'hurdy-gurdy' system without altogether securing any better ones.

"I have learned that the only education worthy of the name is based upon principles derived from the study of child-nature, and from the observation of nature's method of developing and training the inherent powers of children from the very moment of their birth. I have had my eyes opened to observe these processes, and now see much more in the actions of little children than I formerly did. More than this, I have learned to apply the principles of nature to the processes of formal education, and by them to test their value and rightness, so that I need no longer be in doubt and darkness, but have sure grounds to proceed upon under any variation of circumstances.

"Lastly, I have learned to reverence and admire the great and good, who in different ages and various countries have devoted their minds to the principles or the practice of education, whose thoughts, whose successes, whose very failures, are full of instruction for educators of the present day, especially for those who, having been guided to the sure basis upon which true education rests, are in a position to judge of the value of their different theories and plans, and to choose the good and refuse the evil."

"What you have done for me I endeavour to do for my pupils. I make them correct their own errors; indeed, do their own work as much as possible. Since you have been teaching me, my pupils have progressed in mental development as they have never done in all the years I have been teaching. Though from want of power and early training I have not done you the justice which many of your pupils have, still you have set your seal upon me, and made me aim at being, what I was not formerly, a scientific teacher."

" . . . . And now to turn to the modifications introduced into my practice by these Lectures. I was delighted with them, and was more astonished as each week passed at what I heard. New light dawned upon me, and I determined to profit by it. I soon saw some of the prodigious imperfections in my teaching, and set about remedying them. My 'pupils should be self-teachers,' then I must treat them as such. I left off telling them so much, and made them work more. I discontinued correcting their exercises, and made them correct them themselves. I made them look over their dictation before they wrote it, and when it was finished, referred them to the text-book to see whether they had written it correctly. . . . Time would fail me to give in detail all the alterations introduced into my practice."

"In conclusion, considering what my theory and practice were when I entered your class, I am convinced that the benefits I have derived as regards both are as follows:—(1) I have learned to observe, (2) to admire, (3) to imitate, and (4) to follow, Nature. My theories have become based on the firm foundation of principles founded on facts; my practice (falling far short of the perfection that I aim at attaining) is nevertheless in the spirit of it. And although in all probability I shall never equal any of those great teachers whose lives and labours you have described, yet I know that I shall daily improve in my practice if I hold fast to those principles that you have laid down. I consider you have shown me the value of a treasure that I unconsciously possessed—I mean the power of observing Nature, and therefore I feel towards you the same sort of gratitude that the man feels towards the physician who has restored his sight."

These expressions will show that my labours, however imperfect, have not ended in mere talk.

And now it is time to set you free from the long demand I have made on your patience. I have studiously avoided in this

Lecture tickling your ears with rhetorical flourishes. My great master, Jacotot, has taught me that "rhetoric and reason have nothing in common." I have therefore appealed to your reason. I certainly might have condensed my matter more; but long experience in the art of intellectual feeding has convinced me that concentrated food is not easy of digestion. But for this fault—if it be one—and for any other, whether of commission or omission, I throw myself on your indulgent consideration.

THE TRUE FOUNDATION

OF

SCIENCE-TEACHING.

A LECTURE.

*[Delivered at the College of Preceptors, Queen Square, Bloomsbury,
December 11, 1872.]*

THE TRUE FOUNDATION OF SCIENCE-TEACHING.

It is almost a truism to say that the foundation of a building is its most important feature. If the foundation be either insecure in itself, or laid without regard to the plan of the superstructure, the building, as a whole, will be found wanting both in unity and strength. A building is in fact the embodiment and realisation of an idea conceived in the mind of the architect, and if he is competent for his post, and can secure the needful co-operation, the practical expression will symmetrically correspond to the conception. But unless the foundation is solidly laid, and all the parts of the building are constructed with relation to it, his æsthetic and theoretic skill will go for little or nothing. His work is doomed to failure from the beginning, and the extent of the failure will be proportionate to the ambition of the design. These remarks are applicable to the art of building generally, whether shown in large and imposing structures, or in the meanest cottages. In no case can the essential elements of unity and strength be dispensed with.

In these preliminary observations I have foreshadowed the subject with which I have to deal—that of Science-teaching—whether carried on under the direction of a Science and Art Department, or in the smallest class of a private school; and my purpose is to ascertain how far the ideal of theory is realised in the general practice.

Whatever might have been said of the neglect of what is called "science" in former times, we cannot make the same complaint now. A ringing chorus of voices may be heard vociferously demanding science for the children of primary, secondary, and public schools; for the Universities; in short, for all classes of society. "Science," it is said, "is the grand desideratum of our age, the true mark of our civilisation. We want science to supply a mental discipline unfurnished by the old-established curriculum; we want it as the basis of the technical instruction of our workmen."

In answer to this universal demand we see something called Science-teaching finding its way into primary, and even into public schools, in spite of the declaration of an eminent head-master, not longer back than 1863, that instruction in physical science, in the way in which it could be given in Winchester School, was "worthless;" that a "scientific fact was a fact which produced nothing in a boy's mind;" and that this kind of instruction "gave no power whatever." We further see this something, called Science, stimulated by grants and prizes, through the vast machinery of the Science and Art Department; and lastly we have, at this moment, a Royal Commission of eminent scientific men taking evidence and furnishing Reports on "Scientific instruction and the advancement of Science." Who, after this, will be bold enough to say that Science is not looking up in the knowledge-market?

But amidst all the clamour of voices demanding instruction in Science, we listen in vain for the authoritative voice—the voice of the master artist—which shall define for us the aims and ends of Science, and lay down the laws of that teaching by which they are to be effectively secured. As things go, every teacher is left to frame his own theory of Science-teaching, and his own empirical method of carrying it out; and the result is, to apply our illustration, that the fabric of Science-teaching now rising before us rests upon no recognised and established foundation, exhibits no principle of harmonious design, and that its various stages have scarcely any relation to each other, and least of all to any solidly compacted ground-plan.

Before I proceed further in the task I have undertaken, I think it wise, certainly politic, to defend myself against the charge which justly attaches to him who ventures to speak with confidence on a subject with which he is not largely and experimentally acquainted.

It may be said, with too much truth, that I am in this predicament. I am not, and do not for a moment pretend to be, a man of science. Scientific matters have, it is true, always been intensely interesting to me from the time when, as a schoolboy, I used to stuff a volume of Joyce's Scientific Dialogues into my pocket to read when I ought to have been playing· but I was never trained in the method of Science, nor experienced what I have so often conceived, the intense delight of the scientific investigator.

But though not qualified by scientific knowledge to speak of Science, I may venture, as a teacher, to say something about teaching; and, as Science-teaching is a compound term, to hope that any ignorance I may display in treating one of the factors, will be pardoned me, if I can bring some few considerations derived from experience in education, to bear upon the other, which is, from my present point of view, the more important.

The only other preliminary remark that I need make is this, that as our subject is the *foundation* of Science-teaching, I am excused, by the nature of my purpose, from dealing with the higher Science-teaching, presumably built upon that foundation. It is the foundation that, according to my view, requires the most attention.

The first question for consideration is, "What is meant by Science?" The shortest answer that can be given is that "Science is organised knowledge." This is, however, too general for our present purpose, which is, to deal with Physical Science. In a somewhat developed form, then, physical science is an organised knowledge of material, concrete, objective facts or phenomena. The term "organised," it will be seen, is the essence of the definition, inasmuch as it connotes or implies that certain objective relations subsisting, in the nature of things, between facts or phenomena, are subjectively appreciated by the mind—that is, that Science differs from mere knowledge by being a knowledge both of facts and of their relations to each other. The mere random, haphazard accumulation of facts, then, is not Science; but the perception and conception of their natural relations to each other, the comprehension of these relations under general laws, and the organisation of facts and laws into one body, the parts of which are seen to be subservient to each other, *is* Science.

Returning to the other factor of the definition, "Knowledge," we observe that there are two kinds of knowledge—what we know through our own experience, and what we know through the experience of others. Thus, I know by my own knowledge that I have an audience before me, and I know through the knowledge of others that the earth is 25,000 miles in circumference. This latter fact, however, I know in a sense different from that in which I know the former. The one is a part of my experience, of my very being. The other I can only be strictly said to know when I have, by an effort of the mind, passed through the connected chain of facts and reasonings on which the demonstration is founded. Thus only can it become my knowledge in the true sense of the term.

Strictly speaking, then, organised knowledge, or Science, is originally based on unorganised knowledge, and is the outcome of the learner's own observation of facts through the exercise of his own senses, and his own reflection upon what he has observed. This knowledge, ultimately organised into Science through the operation of his mind, he may with just right call his own; and, as a learner, he can properly call no other knowledge his own. What is reported to us by another is that other's, if gained at first-hand by experience; but it stands on a different footing from that which we have gained by our own experience. He merely hands it over to us; but when we receive it, its condition is already changed. It wants the brightness, definiteness, and certainty in our eyes, which it had in his; and, moreover, it is merely a loan, and not our property. The fact, for instance, about the earth's circumference was to him a living fact: it sprang into being as the outcome of experiments and reasonings, with the entire chain of which it was seen by him to be intimately—indeed indissolubly—and organically connected. To us it is a dead fact, severed from its connection with the body of truth, and, by our hypothesis, having no organic relation to the living truths we have gained by our own minds. These are convertible into our Science; that is not. What I insist on then is, that the knowledge from experience—that which is gained by bringing our own minds into direct contact with matter—is the only knowledge that as novices in science we have to do with. The dogmatic knowledge imposed on us by authority, though originally gained by the same means, is really not ours, but another's—is, as far as we are concerned, unorganisable; and therefore, though Science to its proprietor, is not Science to us. To us it is merely information, or haphazard knowledge.

The conclusions, then, at which we arrive are—(1) That the true foundation of physical Science lies in the knowledge of physical facts gained at first-hand by observation and experiment, to be made by the learner himself; (2) that all knowledge not thus gained is, *pro tanto*, unorganisable, and not suited to his actual condition; and (3) that his facts become organised into Science by the operation of his own mind upon them.

Having given some idea of what is meant by Science, and how it grows up in the mind of the learner, I turn now to the teacher, and briefly inquire what is his function in the process of Science-teaching?

I have elsewhere* endeavoured to expound the correlation of learning and teaching, and to show that the natural process of investigation by which the unassisted student—unassisted, that is, by book or teacher—would seek, as a first discoverer, to gain an accurate knowledge of facts and their interpretation, suggests to us both the nature and scope of the teacher's, and especially the Science-teacher's, functions. According to this view of the subject, the learner's method, and the teacher's, serve as a mutual limit to each other. The learner is a discoverer or investigator engaged in interrogating the concrete matter before him, with a view to ascertain its nature and properties: and the teacher is a superintendent or director of the learner's process, pointing out the problem to be solved, concentrating the learner's attention upon it, varying the points of view, suggesting experiments, inquiring what they result in; converting even errors and mistakes into means of increased power, bringing back the old to interpret the new, the known to interpret the unknown, requiring an exact record of results arrived at—in short, exercising all the powers of the learner's mind upon the matter in hand, in order to make him an accurate observer and experimenter, and to train him in the method of investigation.

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* See a Lecture entitled "Theories of Teaching, with the corresponding Practice," delivered April 26, 1869, at the rooms of the Association for the Promotion of Social Science.

The teacher, then, is to be governed in his teaching, not by independent notions of his own, but by considerations inherent in the natural process by which the pupil learns. He is not, therefore, at liberty to ignore this natural process, which essentially involves the observation, experiment, and reflection of the pupil; nor to supersede it by intruding the results of the observation, experiment, and reflection of others. He is, on the contrary, bound to recognise these operations of his pupil's mind as the *true foundation of the Science-teaching* which he professes to carry out. In other words, the process of the learner is the true foundation of that of the teacher.

This sketch would be sufficient were it merely my object to present a theory. But as I am seriously in earnest, and wish to see the claims of Science vindicated, and the teaching of its facts, principles, and laws placed on a totally different ground from that which it now generally occupies, I must pursue the subject further.

It will have been observed that I lay great stress on teaching Science in such a way that it shall become a real training of the student in the method of Science, with a view to the forming of the scientific mind. According to the usual methods of Science-teaching, it is quite possible for a student to "get up," by cramming, a number of books on scientific subjects, to attend lecture after lecture on the same subjects, to be drenched with endless explanations and comments on descriptions of experiments performed by others, to lodge in his memory the technical results of investigations in which he has taken no part himself, together with formulæ, rules, and definitions *ad infinitum;* and yet, after all, never to have even caught a glimpse of the idea involved in investigation, or to have been for a moment animated by the spirit of the scientific explorer. That spirit is a spirit of power, which, not content with the achievements gained by others, seeks to make conquests of its own, and therefore examines, explores, discovers, and invents for itself. These are the manifestations of the spirit of investigation, and that spirit may be excited by the true Science-teacher in the heart of a little child. I may refer, for proof of this assertion, to the teaching of botany to poor village children by the late Professor Henslow; to the teaching of general Science by the late Dean Dawes to a similar class of children; to that pursued at the present time at the Bristol Trade School; and to the invaluable lessons given to the imaginary Harry and Lucy by Miss Edgeworth. Without warranting every process adopted by these eminently successful teachers, some of whom were perhaps a little too much addicted to explaining, I have no hesitation in declaring that they one and all acted mainly on the principle that true Science-teaching consists in bringing the pupil's mind into direct contact with facts—in getting him to investigate, discover, and invent for himself. The same method is recommended in Miss Youmans's philosophical Essay "On the Culture of the Observing Powers of Children,"* and rigorously applied in her "First Lessons on Botany;" and in the Supplement to that little volume I have given, as its editor, a typical lesson on the pile-driving engine, which illustrates the following principles:—

1. That the pupils, throughout the lesson, are learning—*i.e.*, teaching themselves, by the exercise of their own minds, without, and not by, the explanations of the teacher.

2. That the pupils gain their knowledge from the object itself, not from a description of the object furnished by another.

3. That the observations and experiments are their own observations and experiments, made by their own senses and by their

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* "An Essay on the Culture of the Observing Powers of Children, especially in connection with the study of Botany. By Eliza A. Youmans, of New York, with Notes and a Supplement by Joseph Payne." Henry S. King and Co., Cornhill, 1872.

own hands, as investigators seeking to ascertain for themselves what the object before them is, and what it is capable of doing.

4. That the teacher recognises his proper function as that of a guide or director of the pupil's process of self-teaching, which he aids by moral means, but does not supersede by the intervention of his own knowledge.

These hints all tend to show what is really meant by Science-teaching, as generally distinguished from other teaching.

In case, however, my competency to give an opinion on Science-teaching should be questioned, I beg to enforce my views by the authority of Professor Huxley, who, in a lecture on "Scientific Education," thus expresses himself:—"If scientific training is to yield its most eminent results, it must be made practical—that is to say, in explaining to a child the general phenomena of nature, you must, as far as possible, give reality to your teaching by object-lessons. In teaching him botany, he must handle the plants and dissect the flowers for himself; in teaching him physics and chemistry, you must not be solicitous to fill him with information, but you must be careful that what he learns he knows of his own knowledge. Do not be satisfied with telling him that a magnet attracts iron. Let him see that it does; let him feel the pull of the one upon the other for himself. . . . . Pursue this discipline carefully and conscientiously, and you may make sure that, however scanty may be the measure of information which you have poured into the boy's mind, you have created an intellectual habit of priceless value in practical life."

Again, in the same lecture, the Professor says,—"If the great benefits of scientific training are sought, it is essential that such training should be real—that is to say, that the mind of the scholar should be brought into direct relation with fact; that he should not merely be told a thing, but made to see, by the use of his own intellect and ability, that the thing is *so*, and not otherwise. The great peculiarity of scientific training—that in virtue of which it cannot be replaced by any other discipline whatever—is this bringing of the mind directly into contact with fact, and practising the mind in the completest form of induction—that is to say, in drawing conclusions from particular facts made known by immediate observation of Nature."

To the same effect another eminent Science-teacher, Mr. Wilson, of Rugby School, thus expresses himself. "Theory and experience," he says, "alike convince me that the master who is teaching a class quite unfamiliar with scientific method, ought to make his class teach themselves, by thinking out the subjects of the lecture with them, taking up their suggestions and illustrations, criticising them, hunting them down, and proving a suggestion barren or an illustration inapt; starting them on a fresh scent when they are at fault, reminding them of some familiar fact they had overlooked, and so eliciting out of the chaos of vague notions that are afloat on the matter in hand, be it the laws of motion, the evaporation of water, or the origin of the drift, something of order, concatenation, and interest, before the key to the mystery is given, even if, at all, it has to be given. Training to think, not to be a mechanic or a surveyor, must be first and foremost as his object. So valuable are the subjects intrinsically, and such excellent models do they provide, that the most stupid and didactic teaching will not be useless; but it will not be the same source of power that the method of investigation will be in the hands of a good master."

My last quotation will be from the very valuable lecture given here by Dr. Kemshead, the able Science-teacher of Dulwich College, on "The importance of Physical Science as a branch of English General Education." Referring to education generally, he says, and I entirely agree with him,—"I wish it particularly to be borne in mind that, whenever I use the word education, I use it in its highest and truest sense of training and developing the mind. I hold the acquisition of mere useful knowledge, however important and valuable it may be, to be entirely secondary and subsidiary. I consider it to be of more value to teach the young mind to think out one original problem, to draw one correct conclusion for itself, than to have acquired the whole of 'Magnall's Questions' or 'Brewer's Guide to Science.'" There speaks the true teacher. But what does he say on Science-teaching? This:—"I wish particularly to draw the distinction between mere scientific knowledge and scientific training. I do not believe in the former; I do believe in the latter. In physical and experimental science, studied for the sake of training, the mode of teaching is everything. I know of one school [we shall soon see that there are many such] in which physical science is made a strong point in the prospectus, where chemistry is taught by reading a text-book (a very antiquated one, since it only gives forty-five elements), but in which the experiments are learned by heart, and never seen practically. Such a proceeding is a mere farce on Science." But Dr. Kemshead proceeds,—"Of course, as mere useful knowledge, Lardner's handbooks, or any other good text-books, might be committed to memory. So long as the facts are correct, and are put in a manner that the pupil can receive them, the end is gained; but this is not scientific teaching—cramming if you like, but not teaching. It will, I am sure, be manifest to you all that there is nothing of scientific training in this. To develop scientific habits of thought—the scientific mind, the teaching must be of a totally different nature. In order to get the fullest benefit from a scientific education the teacher should endeavour to bring his pupil face to face with the great problems of Nature, as though he were the first discoverer. He should encourage him from the first to record accurately all his experiments, the object he had in view in making them, the results even when they have failed, and the inferences which he draws in each case, with as much rigour and exactitude as though they were to be publised in the 'Philosophical Transactions.' He should, in fact, teach his pupil to face the great problems of Nature as though they had never been solved before."

"To face the great problems of Nature as though they had never been solved before"—"to bring the child face to face with the great problems of Nature, as though he were the first discoverer"—these weighty, pregnant, and luminous expressions contain the essence of the whole question I have endeavoured to set before you. They define, as you easily perceive, the attitude of the pupil in regard to his subjective process of learning, and the function of the teacher in regard to his objective process of teaching—the one being the counterpart of the other.

It will have been noticed, perhaps, that nothing has been said of text-books, which some consider as "the true foundation of Science-teaching." The reason of this omission lies in the nature of things. The books of a true student of physical Science are the associated facts and phenomena of Nature. He finds them in "the running brooks, the mountains, trees, and rocks,—wherever, in short, he is brought face to face with facts and phenomena; these are the pages, whose sentences, phrases, words, and letters he is to decipher and interpret by his own investigation. The intervention of a text-book, so called, between the student and the matter he is to study is an impertinence. For what is such a text-book? A compendium of observations and experiments made by others in view of that very nature-book which, by the hypothesis, he is to study at first-hand for himself, and of definitions, rules, generalisations, and classifications which he is, through the active powers of his mind, to make for himself. The student's own method of study is the true method of Science. He is being gradually initiated in the processes by which both knowledge, truly his own, and the power of gaining more, are secured. Why should we supersede and neutralise his energies and altogether disorganise his plan by requiring him to receive on authority the results of other people's labours in the same field? Again, a text-book on Science is a logically-constructed treatise, in which the propositions last arrived at by the author are presented first—in the reverse order to that followed by the method of Science. The sufficient test of the use of books in Science-teaching is, in fact, this: Do they train the mind to scientific method? If they do not —if, on the contrary, they discountenance that method,—then they are to be rejected in that elementary work—the *foundation* of Science-teaching—with which alone we are here concerned. Once more I appeal to Prof. Huxley, who tells us that, "If scientific education is to be dealt with as mere book-work, it will be better not to attempt it, but to stick to the Latin Grammar, which makes no pretence to be anything but book-work." Again, in his Lecture to Teachers,—"But let me entreat you to remember my last words. Mere book learning in physical Science is a sham and a delusion. What you teach, unless you wish to be impostors, that you must first know; and real knowledge in Science means personal acquaintance with the facts, be they few or many." But I must add to these authoritative words those of Dr. Acland, who, when asked by the Public Schools Commission his opinion of the London University Examinations in Physical Science, thus replied:—"I may say, generally, that I should value all knowledge of these physical sciences very little indeed unless it was otherwise than book-work. If it is merely a question of getting up certain books, and being able to answer certain book questions, that is merely an exercise of the memory of a very useless kind The great object, though not the sole object, of this training should be to get the boys to observe and understand the action of matter in some department or another. . . . . I want them to see and know the things, and in that way they will evoke many qualities of the mind, which the study of these subjects is intended to develop" (vol. iv, p. 407). These words sufficiently show both what the true foundation is, and what is it not. Once more—for the importance of this matter can hardly be too much insisted on—hear what Prof. Huxley says, in his evidence before the Commission on Scientific Instruction (p. 23):—"The great blunder that our people make, I think, is attempting to teach from books; our schoolmasters have largely been taught from books and nothing but books, and a great many of them understand nothing but book-teaching, as far as I can see. The consequence is, that when they attempt to deal with Scientific teaching, they make nothing of it. If you are setting to work to teach a child Science, you must teach it through its eyes, and its hands, and its senses."

Having now obtained some notion of the true foundation of Science-teaching, we proceed to inquire where, and by whom, this notion of it is carried out. At this point our ears are saluted by a thousand voices, crying out, "Here—here Science is taught! This—this is the place you are seeking!" We follow the voices, and find, in a multitude of cases, that the thing called Science-teaching has no feature in common with that of which we are in search. We find cramming by text-books, cramming by lectures, experimenting done for, and not by, the students, &c.; and only here and there do we find Science-teaching pursued by the method of investigation—the only method by which, according to the best authorities, it can be pursued so as to gain really valuable results—results worthy of the high dignity of the subject. But, in the midst of our bewilderment, we hear the loud voices of the Science and Art Department declaring, authoritatively, that they can show us what we are seeking for. "Look," they say, "at our 800 or 900 Science schools and classes; examine carefully our 38,000 pupils; see the liberal grants and the numerous prizes that we give every year to reward the teachers and the cultivators of Science. What we are doing for Science is wonderful. Have we not twenty-three Sciences in our curriculum, and twenty-three eminent professional examiners to ascertain that they are well learnt and taught?" Our spirit rises to enthusiasm at these tidings. We long to enter the schools, and observe the studies of the 38,000 pupils, all presumably pursuing the true method of investigation under teachers who understand it, and all, in their different stages of advancement, gradually acquiring the scientific mind. Seeing, moreover, the great name of Prof. Huxley in the list of examiners, and knowing what his often-expressed notions on Science-teaching are, we look forward with delight to the exemplification of it in the Science schools and classes. Before, however, we enter on our personal inquiry, we turn to the Directory of the Science Department, to discover the views of the Department on the theory of Science-teaching, or at least a definition of Science which may serve as a guide to the practical operations of those who are engaged in carrying out its views Not one word, however, do we find to enlighten us on this essential point, nor a single hint as to the true method of Science-teaching. All that we ascertain at our first glance is, that Science—is Science. Our enthusiasm is somewhat damped; but on looking a little more closely, we come upon the formidable array of twenty-three Sciences, which the Department takes under its charge, or for "promoting instruction," in which it gives "grants" as a "stimulus to the founding and maintenance of Science schools and classes." We fail, however, to find in the Directory what we wish to know about the spirit of the teaching; whether it is such as to realise "the great benefits" of which Prof. Huxley speaks; such as to ensure real knowledge and practical discipline;" such as "to bring the mind directly into contact with facts;" such as "to practise the mind in the completest form of induction." We turn, therefore, to the Examination questions published by the Department, not doubting to detect in the nature of the questions the character of the instruction given; the proof, in short, that this instruction has been "real and practical," and that the questions are intended to ascertain "what the learner knows of his own knowledge," as Prof. Huxley pithily phrases it. After poring, however, over the ninety-one pages of Examination papers, the only question that can be found which seems to answer the requirement that the learner is to describe "what he knows of his own knowledge," is one of Prof. Huxley's. Here it is—"How are sniffing and sneezing effected?" This seems to point to practical experience—but even here there is some room for doubt.

The suspicions, then, that we entertained when we found that the Science Department omitted to furnish a theory or definition of Science to work up to, and any hint respecting the true method of teaching it, are confirmed by an examination of the questions themselves, and we come to the inevitable conclusion that the whole scheme for promoting Science is neither more nor less than a scheme for promoting the cramming up of scientific text-books, for stimulating that "mere book-work" which, we have just been told, is so useless for the purposes of Science, that we had better "stick to the Latin Grammar" than attempt to acquire it that way. Still we can hardly believe that great authorities on education like "My Lords" can fancy that they are effectually promoting the interests of Science by paying for results gained by this "mere book-work," which practically neutralizes all "the great benefits" to be gained by true scientific training. All doubt on this point is, however, removed when we find page after page of the Directory filled up with the titles of books which are, on the recommendation of "My Lords," to help to defeat the very conception of scientific teaching.

But we may inquire for a moment, How does this scheme act on the future interests of Science as far as teachers are concerned? In this way. As soon as a young man has crammed up a subject from his text-book, he presents himself for examination. He passes, and receives a certificate; and then, though he may never have made a single independent observation or experiment, may never have caught even a glimpse of scientific method, and may be utterly without the valuable mental discipline which Prof. Huxley tells us cannot be replaced by any other, he is *ipso facto* qualified and accredited to teach Science, and to earn payments on the results of his so-called teaching.

I do not for a moment deny that much is to be gained from the study of scientific text-books. It would be absurd to do so. What I do deny is that the reading up of books on Science—which is, strictly speaking, a literary study—either is, or can possibly be, a training in scientific method. To receive facts in Science on any other authority than that of the facts themselves; to get up the observations, experiments, and comments of others, instead of observing, experimenting, and commenting ourselves; to learn definitions, rules, abstract propositions, technicalities, before we personally deal with the facts which lead up to them; all this, whether in literary or scientific education—and especially in the latter—is of the essence of cramming, and is therefore entirely opposed to, and destructive of, true mental training and discipline.

Therefore it is that I see with regret the vast machinery of the Science Department—which, were it reconstructed and reorganised, might do so much for Science—doing in effect so little—so little, that is, in proportion to its powers and opportunities—to help in laying the true foundation of Science-teaching.

This question of Science-teaching is, in fact, the question of all education, and the process of reconstruction must be applied to the Education Department as well as to the Science Department. As things stand, these departments are perhaps the most powerful promoters of mechanical drill and cram that the world ever knew. Hence the deplorable results of the Revised Code,—one child only in sixty-three throughout the primary schools of the country being able to pass the 6th Standard: and hence, too, the scarcely less deplorable result, in the case of Science, that that special mental training—that method of investigation which constitutes its glory, is set aside and treated as worthless.

It is pleasant, however, to see that light is springing up. There is, as I have said, a Royal Commission on Scientific Instruction and the Advancement of Science now sitting. In their second Report, published a short time ago, occur these words, in reference to their opinion that instruction in physical Science ought to be a part of the curriculum of primary schools: "The instruction," they say, "to which we refer, though scientific in substance, should in form be devoid of needless technicality, and should be almost wholly confined to such facts as can be brought under the direct observation of the scholar. It should, in fact, be conveyed by object lessons, so arranged and methodised as to give an intelligent idea of those more prominent phenomena which lie around every child, and which he is apt to pass without notice."

This is quite to the point, and, if carried out in a proper way, will do much to vindicate the neglected claims of Science. Yet even in this Report it is strange to notice the imperfect appreciation of the central principle of the whole—the spirit and method of the teaching. The Commissioners do, indeed, say that, to render this instruction successful, the teachers must have been "carefully trained in the special methods of teaching Science;" but they give no hint as to what these special methods are—whether their speciality consists in cramming up a book, or in learning from Nature and fact. There ought to be no room for mistake on a point like this. Both these processes go now by the name of Science-teaching. Even Dr. Carpenter, who tells us truly that "it is the essence [mark the word] of scientific training that the mind finds the objects of its study in the external world," also claims credit, five minutes before, for the work of the University of London, which simply consists in examining those whose minds "find the objects of their study" in the pages of a book; who, to use the words of Agassiz, "study Nature in the house, and when they go out of doors cannot find her." Now, I maintain that the two teachings—if both must be called by the same name—are diametrically opposed in spirit, in aim, in *modus operandi*, in results; and that he who loves the one must hate the other. In that serene atmosphere of Science in which the eminent Commissioners continually dwell, of course no such feeling as "hate" is possible; but I do wish they had told us in unmistakable language what they mean by the special teaching of Science, and where we can see it exemplified. It is clear enough that such teaching is by no means universal: for we find the Commissioners, after having had the Examiners of the Science Department before them, declaring to the world that these Examiners are "under the impression that a *very large part* of the instruction is *derived from books;* and that it is not often illustrated by specimens or experiments, the use of apparatus, or the out-door study of Nature." After rejecting (in 1870) 15,723 papers out of 34,413, the Examiners certainly had some grounds for their impressions (impressions which might have been anticipated from the nature of the case); but the remarkable point—the amusing point in the whole business, is this, that the Commissioners appear to be surprised at these results of the Science Department system. Surely they had never looked into the Directory, nor observed that the essence of that system is the cramming of book-work; that long lists of books suitable for the purpose are given, and not a single hint thrown out that the teaching is to be practical or disciplinary, or to have any connection whatever with Nature and fact. The fruits, then, are the proper fruits of the tree; they could hardly have been other than they are; and it is perhaps a little inconsiderate on the part of the Commissioners to reproach, even in this delicate way, the Science-teaching system which "My Lords," in their wisdom, have sanctioned and promoted. One hopes, of course, that "My Lords" will not be so imprudent as to reply that the failures have arisen from the bad getting up of the books; and yet one can hardly see any other reply from them possible. If, however, this should be the reply, the rejoinder that I venture to make for the Commissioners is this,—"Education means, and is, development and training. Development and training of the mind come from its own exercise, through observation and experiment at first-hand upon Nature and fact. If for this primary study of Nature and fact you substitute the study of other people's studies of these same subjects you necessitate cram; and Nature ordains that by cram you shall perish—*i.e.*, that by aiming simply at *quantity* of results, without regard to *quality*, you shall end in getting neither quantity nor quality." The experiment as to primary education is of the same kind, and its miserable results bear witness to the fundamental error on which both are founded.

In reading over the evidence taken by the Commissioners, one is struck by the apparent indifference to this very important question of the teaching on the part of scientific men of all kinds. Drs. Acland, Frankland, Sharpey, and Huxley stand almost alone among the Professors; and Mr. Louis Miall and Mr. Coomber almost alone among the Science-teachers, in claiming for Science that it should be worthily, *i.e.*, soundly and practically, taught. Mr. Miall particularly objects to the Science Department's scheme. He says,—"The regulations of the Department do not encourage what I should call a real style of teaching. Teaching of scientific subjects, which ought, as I imagine, to be of a highly practical character, is very largely conducted by such means as reading out slowly notes to be taken down verbatim and committed to memory; or again, by a large use of elementary text-books, which are made as condensed as possible, and are in many cases almost learnt off by heart by frequent repetition." Admirable mental discipline!—a singular exemplification of the way in which the scientific mind is formed! After this we are not surprised to find Mr. Miall (who is, I am told, highly qualified by experience and knowledge to pronounce an opinion) declaring: "If the Science classes in connection with the Department [he is speaking particularly of Bradford] were to go on for fifty years as they are doing at present, I do not think they would produce any perceptible effect upon the industrial occupations"—that being the object they have professedly in view.

As some set-off against the strictures I have passed on the Science Department arrangements, it ought to be mentioned that the provision mades for giving practical instruction every year to those teachers who come up to London for the purpose are most excellent. Six weeks of such training is worth more than book-work cramming for twelve months, especially if the teachers are Professors Huxley and Carey Foster and Mr. Ray Lankester.

Had there been time, I would have given some account of Weinhold's Treatise on Physics ("Vorschule der Experimental-physik"), in which the subject is built up under the observing eyes and experimenting hands of the students; and a little elementary book on Heat by Mr. Macgill (published by Nelson & Co.), in which Science is treated as a means of training, and the difference practically shown between "knowledge gained and used," and knowledge merely given."

I must, however, conclude by urging upon your attention the serious nature of the question I have discussed. If I have succeeded not only in making clear the true foundation of Science-teaching, but in producing convictions in your minds which may lead to action, I shall have accomplished my purpose.

APPENDIX.

I.—Extracts from Replies to Questions put by direction of the Duke of Devonshire, as Chairman of the Royal Commission on Scientific Instruction, to the Professional Examiners of the Science Department.

The questions were—

1. What is the evidence afforded as to the practical nature of the teaching?
2. What opinion have you formed as to the amount of "cram," and the power of testing it by examination?
3. What test is afforded, by passing in the advanced papers, as to the fitness of a candidate to become a teacher?

Replies.

3. "In consequence of the plain evidences of the 'cram' system pursued which are afforded by the results that have passed through my hands, I beg leave to give my unqualified opinion that no student who has obtained, even a first class, in either first or second grade, should be allowed, on the strength of that success only, to constitute himself a teacher of others."—F. A. Bradley, *Examiner in Practical Plane and Solid Geometry.*

2. "The amount of 'cram' is considerable in some subjects, such as Geometry and the introductory part of Trigonometry. In the former subject it is an undoubted fact that *Euclid is learned by heart* in many schools."—B. M. Cowie, *Examiner in Pure Mathematics.*

2. "By 'cram' in Mathematics I understand the loading of the memory with verbal answers to anticipated questions, and with rules and demonstrations which the understanding has not fathomed. This vicious habit undoubtedly prevails to a deplorable degree. It is the natural offspring of competitive examination, the invariable resource of the incompetent and indolent, who covet, but do not deserve, the worldly advantages which success in examinations secures."—T. A. Hirst, *Examiner in the Higher Pure Mathematics.*

3. "A teacher ought be able to pass an examination in the higher branches of the subject he professes to teach. This, however, is a very insufficient test indeed of his fitness to teach. Other qualities, moral and intellectual, are required in a teacher, the presence or absence of which written examinations cannot in the least reveal."—*Idem.*

2. "There is undoubtedly a considerable amount of 'cram.' I judge of this by the set phrases by which in some classes certain questions are answered."—Andrew C. Ramsay, *Examiner in Geology.*

3. "Persons who 'go in' for this office [of teacher] are often very ill qualified for it. It seems to me that often the fact that they are ignorant and ill educated is the reason why, they consider themselves likely to be qualified for the office of teacher."—*Idem.*

1. "The papers do not afford any strong evidence of the teaching having been practical. . . . . As a whole the teaching must still be regarded as chiefly book-work."—Dr. **Rutherford**, Dr. **Michael Foster**, *Examiners for* Professor **Huxley** *in Physiology.*

2. "There is abundant evidence every year of cramming."—*Idem.*

2. "I am of opinion that there is a large amount of cram, and *bad* cram too."—**John Percy**, *Examiner in Metallurgy.*

II.—EXTRACTS FROM THE EVIDENCE GIVEN BEFORE THE ROYAL COMMISSION.

Mr. **Henry Cole**.—Mr. Cole is of opinion (Question 32, Second Report of the Royal Commission) that "a preliminary examination [of the teacher's qualifications] is not of much importance;" and at the same time (Question 43) that a training school for teachers "is the one thing that is especially wanting at the present time;" inasmuch as (Question 83) "the acquisition of general knowledge, and the power of efficiently imparting it, are two different things."

Professor **Huxley**, in opposition to Mr. Cole (Question 273), would "like to see all the teachers put through a special examination."

Dr. **Ramsay** (Question 569) says:—"It appears to me that some of the teachers . . . . are apt to get up their knowledge by a special process of self-cramming, and that from that imperfect kind of knowledge they cram a number of the younger pupils, whom I guess to be mere children, and who answer by rote." Also, from Questions 601, 602, it appears that Dr. Ramsay "infers" that "the instruction given is chiefly from books," and that it "very rarely happens that the instruction is gained in any other way, from specimens or from practical knowledge."

Professor **Frankland**, speaking of the results of his own examinations of the Chemistry papers, says (Questions 766): "It was evident that the candidates had depended too much upon mere book-work and oral instruction; they had not been sufficiently brought into contact with the phenomena themselves. . . . Practical instruction, in which the pupil is made an operator, is by far the most valuable kind of chemical teaching. . . . . A training in experimental Science does not contemplate merely the reading and committing to memory of the thoughts of others, but much more, an actual contact of the student with the phenomena presented by the objects which surround him."

Professor **Williamson**, in reference to the test of the teacher's fitness, says (Question 1187*a*):—"The examination test alone, when applied as it is, is productive of one great evil, especially when examinations aim at directing teaching, and profess to take the lead of teachers, and that is to call forth crams. I believe that there is hardly any case of really good teaching being produced by examinations." Further (Question 1297), "Anybody who has done a thing has learned more than any one who has only seen it."

Mr. T. W. **Shore** (Question 2206):—"By the present wholesale and indiscriminate system . . . . a candidate may be recognised as qualified to teach such a subject as Chemistry without ever having handled chemical apparatus, or even seen a single chemical experiment, for the examination has been, and can be, passed from book-work only. Such an attempt to spread science among the masses will tend inevitably to a decrease of scientific accuracy, in teaching a contempt for the teacher's office, and, among artisans, a loss of confidence in such teachers, the power of maintaining which should be an essential qualification."

Mr. **Louis Miall** (Question 6247): "Students are often passed whose knowledge is, I might say, absurdly inadequate—students who have no real knowledge of the subject at all; and this is particularly unfortunate, as the passing of the examination qualifies them to become teachers." Again, Question 6357) :—"The teaching which I am accustomed to give would not pass pupils. . . . . We endeavour, as far as possible, to make all our teaching practical. . . . Our teaching does not qualify students to pass the examination of the Science and Art Department. . . . . They do not get up that style of answers that would suffice to pass them. We endeavour to make our class of instruction sound and practical, but we should have to adopt a totally different system if we aimed at passing a number of pupils." (Question 6277) :—"It would appear to me that the essential and cardinal faults of the present system are, first of all, that the training and teaching qualification of the teachers is far too low; secondly, that owing to the entire absence of practical examination, a very defective style of teaching is encouraged; and thirdly, that it is at the option of the teacher to take any subjects he pleases, in any order."

III.—The Teaching of Nature and Fact.

"The entire process of the earliest instruction of children should consist in training the faculties for their subsequent work; and for this instruction God's book of the Universe is better suited than any books of men. The facts and phenomena of Nature are the sentences, words, and letters which, before all others, the child should be taught to read; and, if taught to read them by a teacher who knows his business, they furnish the soundest and most interesting instruction that the child is capable of receiving. The materials for the lesson are constantly at hand; the faculties for using them are constantly ready for use; and it is the very *raison d'être* of the teacher, the purpose for which he exists, to bring the materials and the faculties into contact, and thus to make the child find tongues in trees, sermons in stones, and books in the running brooks. For want of such teaching, the child grows to a man, and as a man lives all his life, carrying with him eyes which do not see, ears which do not hear, a mind which does not think. By means of such lessons the art of observing may be definitely taught, the art of inventing prompted, and the method of scientific investigation initiated."—*From a paper read by the Lecturer " On the teaching of Elementary Science as a part of the Earliest Instruction of Children," at the Leeds Meeting of the Social Science Association.*

A

PREFACE AND SUPPLEMENT

TO AN

ESSAY ON THE CULTURE

OF THE

OBSERVING POWERS OF CHILDREN.

BY ELIZA A. YOUMANS.

PREFACE

TO

THE ENGLISH EDITION.

THE EDITOR'S acquaintance with the valuable treatise which he now brings before the English public is of recent date. He had undertaken to write a brief paper for the Leeds Meeting of the Social Science Association, on "The Teaching of Elementary Science as a Part of the Earliest Instruction of Children," and had completed the arguments and illustrations by which he endeavoured to show that, in the true order of things, the earliest formal instruction of children should be a *continuation* of that which they had already unconsciously received from Nature and Fact, when Dr. Youmans, of New York, put into his hands the "First Book of Botany," and the little treatise, which is here republished, "On the Culture of the Observing Powers of Children," written by Miss Youmans. He was at once struck with the remarkable correspondence between the views taken by Miss Youmans and those which he had presented in his own paper, and proportionally interested in the fact that these views had been realised in successful practice. It therefore occurred to him that he should be doing a service to the cause of education by bringing them under the notice of English teachers, and of all who take an interest in the improvement of elementary instruction. He has a profound conviction—which many others share with him—that what is demanded by the present times is not so much extended machinery as better teachers—teachers more thoroughly acquainted with the nature of the mind with which they are professedly dealing, and capable of making their knowledge of the processes of education more productive in results; and, moreover, that the improved teaching which is needed must begin at the beginning. As things are we adopt conventional opinions respecting the essentials of instructions—frequently confounding the means with the end—and entrust the most delicate and difficult part of the process—the early development and training of the mind

—to teachers who have no other idea of teaching than that it is a sort of mechanical grinding, which is somehow or other to produce the desired result. We all recognise the usual product of such grinding in countless examples of children exposed to it, who grow up to manhood and pass their lives in the possession of eyes that do not see, ears that do not hear, and minds that have never been taught to think. The teaching, however, which ends in such results as these is, to speak strictly, no teaching at all.

It fails altogether as an agency for quickening intelligence through the acquisition of knowledge. The teacher has not done what he engaged to do. He professed to be an artist aiming to secure, through the resources of his art, a definite end; that end he has not secured. He undertook—what Nature left alone does not undertake—to teach his pupils not only to think, but to think with a fixed purpose in view; not only to set their minds in motion, but to direct that motion so as to make it effectual for (1) the acquisition of exact knowledge, (2) the formation of good mental habits, (3) and consequently, the attainment of a consciousness of power applicable to all cases of mental action. His work has proved inefficient in all these respects, and he has therefore failed in the very object of his existence.

The didactic method—the method of endless telling, explaining, thinking for the pupil, and ordering him to learn—has had its day. It is, then, worth while to consider whether it may not be superseded by one which recognises the native ability of the human mind, under competent guidance, to work out its own education by means of its own active exercise.

Miss Youmans's method, by providing for the exercise of the pupil's own mind on concrete facts, which are to be observed, investigated, judged of, and described by himself, is an obvious recognition of this principle; and in carrying it out she supersedes "the usual desultory practice of object-teaching in noting the disconnected properties of casual objects," by "training him (to use her own words) not only to observe the sensible facts, but constantly to put them into those relations of thought by which they become organised knowledge."

In general, then, the purpose of this little book is to give the elementary teacher an enlarged and enlightened view of his proper functions, to fix attention on principles rather than routine, to supersede didactic cramming by systematic mental training; and, in short, to place the noble art of teaching upon a solid foundation.

The editor has added a few notes by way of enforcing the author's general argument, and in his "Supplement" has endeavoured to illustrate a principle to which he attaches great importance, as the key-note to the art of teaching; namely, that the process by which the pupil learns being essentially one of subjective, conscious, self-instruction, the teacher's counterpart, conscious objective process, ought always to recognise this fact; that, in short, only in proportion as the teacher aids, without superseding, the pupil's own efforts to teach himself, will he be successful in his teaching.

From a conviction, moreover, that the study of a descriptive science like Botany does not sufficiently develop the instinct for experiment, nor supply a training in the doctrine of forces, he has shown, by a typical lesson, how the elements of mechanics may be learnt by young children through their own observation and experiments, without explanations from the teacher—the learners being considered in the light of investigators, seeking to ascertain at first hand facts and their interpretation.

4, Kildare Gardens,
May 1*st*, 1872.

SUPPLEMENT BY THE EDITOR:

ILLUSTRATING THE FOREGOING PRINCIPLES AND APPLYING THEM TO THE ELEMENTARY STUDY OF MECHANICS.

It will have been seen that the special characteristic of the method of this book is, that the author insists on the principle that all elementary instruction which is intended to train the mind must be based on objective, concrete fact, and provides no other basis. The facts themselves, not the explanations, deductions, or comments of others upon them, are to be brought at first hand into immediate contact with the pupil's mind. In the natural order of things, the facts come first, the comments afterwards, and the child, in his acquisition of knowledge, should follow the natural order. This is the historical method, the method of the investigator, who gains his ends by observation and experiment, acquiring knowledge by the exercise of his senses, by analysis and comparison, and testing it by synthetical applications. The child, too, may be regarded as an explorer or investigator, who is to proceed by the same method. He, too, can gain knowledge by observation and experiment, and that only is truly his own which he gains by these means.

This proposition will be considered by many teachers as needing proof. The remark is, however, intended to apply only to the *most elementary instruction*, as part of a system of *mental training*. The purpose of such instruction should obviously be to impress upon the pupil's mind clear and definite ideas, however few, and to foreclose his mind, for the time being, to all others.* The quantity of knowledge that he gains under the process is of small importance compared with its quality, and its quality depends upon the manner in which he gains it. What he gains at first hand, by his own mental labour, and what he acquires as the result of other people's labour, may both become his own property, but they are different in their nature, and are held on totally different tenures; and it is maintained that the child *under training* is only concerned with the former. He is to learn how to acquire property himself, that he may know the value of property in general, and may be able to appreciate the various methods by which others acquire it. In a similar way, the mechanic learns his art by continually handling his tools, until, having gained experience by daily practice, he at length becomes capable of appreciating the finished and elaborate work of his more advanced fellow-labourers. His competency, however, to form a mature judgment on their performance, and to do what they do, is founded essentially on his own previous knowledge and experience. It is in this sense that the assertion is made, that in the case of a child under elementary training, that knowledge only which he gains by his own observation and experiment is truly his own.

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* "L'esprit de mon institution n'est pas d'enseigner à l'enfant beaucoup de choses, mais de ne laisser jamais entrer dans son cerveau que des idées justes et claires."—Rousseau, *Émile*.

The time of course comes when he must receive many things on the authority of others, as, for instance, when he learns Geography and History. These subjects do not, indeed, consistently with the views here maintained, enter into the curriculum of the *earliest* elementary instruction, which should be strictly confined to matters on which the pupil can exercise his own powers of observation and experiment. When, however, the time does come for learning them, it will be found that the child furnished with a substratum of knowledge gained by his own efforts, will be in a far better condition for receiving and appropriating that supplied him by others than one who has not had the previous training.

It may, however, be further objected, that it is unreasonable to require the pupil to discover for himself what has been already discovered by others, and lies ready at hand. The objection would be valid if it were true that he *could*, while yet a novice in learning, in the true sense of the term, appropriate what another has gained; but the fact remains that the child's mental appropriation of objective knowledge can be secured only by certain subjective processes which another can no more perform for him than walk, sleep, or digest for him. That only, therefore, in an educational sense, is knowledge to us which we have gained through the working of our own minds. We do, indeed, please ourselves with the fancy that we can assume as our own the vast field of science which we have, as a people, inherited; but, after all, it is an ultimate fact of human nature, that there is no "common measure" between a nation's progress in knowledge and an individual's; so that, however large may be the inheritance bequeathed to us, we can enter on it in no other way than that by which it was first acquired—the way of observation and experiment. Whatever is acquired by any other means is of the nature of cramming, and has nothing in common with the true *elementary culture* of the mind.*

These considerations help us to define the relation between the material of instruction, the learner, and the teacher. The material should be objective, concrete fact; the learner, one who applies his senses, his powers of perception, apprehension, analysis, comparison —his whole mind, in short—with a view to ascertain the nature and phenomena of the fact, by interrogating it in every possible way; and the teacher, one who, recognising and understanding the learner's process of investigation, aids him in it by every means which does not interfere with it. He does, not, therefore, tell his pupils that this object is hard, that soft; he makes them feel it themselves; he does not explain that this object has a certain external relation to that; he places them in juxtaposition, and invites comparison; he directs them to congregate particulars, and at the right time calls for generalisation and classification; he does not point out that this is a cause, and that an effect, but prompts them to make the experiments which suggest the relation; he does not anxiously correct their blunders, but, either at the moment or subsequently, takes care that they are corrected by themselves; he gives them no technical names until they know the things or phenomena which require to be named; and finally, distrusting their memory, he often repeats his lessons in order to deepen impressions and prevent the loss of what has once been acquired.

From this enumeration of the several functions of the learner and teacher, it is clear that the former is an investigator engaged in teaching himself by means of concrete facts, and that the latter is a guide, director, or superintendent of the process by which the pupil learns.

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* The writer is anxious to guard against any misconstruction of his meaning in reference to "cramming." He has already denounced its "unlawfulness" as a part of elementary training, but he admits, of course, its lawfulness, and indeed necessity, in a more advanced stage of instruction, and in the business of life. What he insists on is, that by enfeebling the growing powers it is antagonistic to mental culture, and, moreover, that when it is necessary the cultivated mind will appreciate in a higher sense and appropriate far more effectually the knowledge gained by others, than the mind which has been accustomed from the beginning blindly to receive and adopt the conclusions of others as its own. In other words, the mind that is not used to cramming will cram to far better purpose when the occasion arises than that which is; and will, besides, more competently deal with general propositions framed by others from having been employed in forming such propositions itself.

These views of the respective functions of the learner and teacher will of course hardly satisfy those who assume that every one who knows a subject is competent to teach it: all experience, however, is against this assumption. The teacher should indeed thoroughly know his subject. This knowledge will guide him in bringing the object to be learned in contact with the pupil's consciousness by the question he asks, and is, moreover, a guarantee, that he has himself had experience of the subjective process of learning, but is no guarantee that he has a right conception of his proper function as a teacher, or a conscious knowledge of the process by which all minds learn. He may know his subject, but be entirely ignorant of the best means of making his pupils know it too, which should be the end of all teaching. The question at issue resolves itself, indeed, into that of the means by which knowledge is naturally gained; and the main point in the inquiry is, How is all knowledge which we can truly call our own obtained? Does a child come to know a flower, for instance, because his teacher, having exercised his mind upon it, knows it, or because the child himself has exercised his own mind upon it? Even if we allow—which we do not—that the child is incapable of seeing the flower aright, of discriminating between its parts, and appreciating their relations by his own powers of mind, it must be admitted that the ultimate act which makes the idea a mental possession is, and must be, the child's own, not the teacher's. But indeed all the processes of perception, observation, comparison, reasoning, judgment, by which solid knowledge is gained, are so many means by which the investigating mind works in attaining its object, and can only be performed by the learner himself. The teacher who intrudes the knowledge he has gained by means equally accessible to the child, does a work of supererogation, and gives at second hand what the learner would better gain at first hand, and by so doing supersedes the more valuable teaching given by the fact or object itself. *In* learning what an object is, the object itself is the best possible teacher. The lessons it gives are clear, forcible, and definite, and stamp themselves directly on the mind. Those substituted for them by the professed teacher may be quite otherwise, inasmuch as, if he learned them originally from the object itself, he may not have learned them correctly, or if he merely transmits impressions which have passed through other minds without reference to the original teacher—the fact or object—he may convey error instead of truth to his pupil. No account, in short, can be given by another, of the nature of an object equal in vividness, force, and truth, to that which the object itself can give. But further, the teacher who assumes that his best service to his pupils consists in doing their proper work of observation, &c., for them, not only does what is unnecessary, but what may be positively injurious. His professed object, as a teacher, is to educate as well as to instruct; to train the faculties through the process of instruction.* But he can train only by calling into exercise the pupil's own powers. The substitution of his own thought for the pupil's, except as a means to this end, tends to defeat the object in view. All explanations, therefore, by the teacher, of relations which are obvious and patent in the things themselves, supersede the pupil's own mental activities, and hinder, to some extent, that exercise of mind which is essential to development and training. Explanation is "flattening," "making level," or "clearing the ground," so as to produce an even surface, and, as applied to teaching, signifies removing obstructions out of the way. This work, however, as being, in our view, the only means by which the pupil's mind is to be trained to the consciousness of its powers, belongs to the learner, not to the teacher, and the teacher who does it for him injuriously interferes with, and in fact defeats, as we have just said, the object in view. The human mind, which is naturally endowed with a capacity for observing aggregates, is also endowed with a capacity for disintegrating them, and detecting the relation of the parts to the whole, and further, with a capacity for reasoning on these relations and forming a judgment upon them. It has, moreover, the ability to apply the knowledge thus gained to the acquisition of more—to use the known to interpret the unknown. All these processes are essentially of the nature of explanations, but then they are explanations which result from the working of the learner's own mind on the matter of study, not from the working of the teacher's mind; and to return to the former assertion—the teacher who intrudes his own explanations injuriously interferes with the machinery, and hinders it from securing its best products. The teacher's whole business, in short, is to teach his pupil how to think, and this can only be effected by making him do all the thinking himself, "absolutely without aid" (see Dr. Temple's remark below), not by thinking for him.*

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* It may be worth while to remark, as the point is often misapprehended, that Education (from *educare*, a frequentative of *educere*, to draw forth) is the drawing forth, by *repeated acts*, of the pupil's powers, the training of them to their proper work, and that Instruction (from *instruere*, to place materials together *for a definite end*) is the orderly placing of knowledge in the mind. Hence, only an instructor scientifically equipped for his profession is at the same time an educator. The teacher who merely gets his pupil to accumulate disconnected bits of "information" about all sorts of subjects is no instructor, and, therefore, no educator, in the true sense of the terms.

It scarcely needs to be pointed out, that the question of the necessity of explanations in elementary teaching involves that of the subject and order of studies. "If the subject is unsuited to the child's stage of instruction, or if, instead of presenting him with facts which he can understand, we force upon him abstractions which he cannot, we create the need for explanations." He can understand concrete facts, by applying his natural faculties of observation to them, but he cannot understand general principles framed by others upon facts which he does not know. The recognition of this principle furnishes a test of the suitability of any given subject for the earliest stage of elementary instruction. Those subjects alone are suitable which admit of independent investigation, which require no evidence but that of the senses, and can therefore be brought into immediate contact, without the descriptions and explanations of others, with the learner's own mind. In the progress of instruction, the knowledge gained by others—as in Geography and History—will fitly take its proper place; but in the first instance, and with an especial view to training the mind, the pupil's knowledge should be all his own—the sole product of his own thought. Facts, then, and phenomena—the facts and phenomena of the material world—are the proper food of the mind learning to think, and it is the perception and appreciation of this principle which constitutes the merit of Miss Youmans's method of teaching Botany.

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* There is abundant authority for the correctness of these views on the value of the learner's self-tuition. "All the best cultivation of a child's mind," says Bishop Temple, "is obtained by the child's own exertion, and the master's success may be measured by the degree in which he can bring his scholars to make such exertions absolutely without aid." Rousseau, too, recommending self-teaching, says: "Forcé d'apprendre de lui-même, il (the pupil) use de sa raison et non de celle d'autrui, car, pour ne rien donner à l'opinion, il ne faut rien donner à l'autorité; et la plupart de nos erreurs nous viennent bien moins de nous que des autres. De cet exercice continuel il doit résulter une vigueur d'esprit semblable à celle qu'on donne au corps par le travail et par la fatigue. Un autre avantage est qu'on n'avance qu'à proportion de ses forces. L'esprit, non plus que le corps, ne porte que ce qu'il peut porter. Quand l'entendement s'approprie les choses avant de les déposer dans la mémoire, ce qu'il en tire ensuite est à lui; au lieu qu'en surchargeant la mémoire, à son insu on s'expose à n'en jamais rien tirer qui lui soit propre." Again: "Sans contredit on prend des notions bien plus claires et bien plus sûres des choses qu'on apprend ainsi de soi-même que de celles qu'on tient des enseignements d'autrui: et, outre qu'on n'accoutume point sa raison à se soumettre servilement à l'autorité, l'on se rend plus ingénieux à trouver des rapports, à lier des idées, à inventer des instruments, que quand, adoptant tout cela tel qu'on nous le donne, nous laissons affaisser notre esprit dans la nonchalance, comme le corps d'un homme qui, toujours habillé, chaussé, servi par ses gens et traîné par ses chevaux, perd à la fin la force et l'usage de ses membres."—*Émile.*

It is important, however, to remark, that, valuable as the study of Botany is as a means of cultivating the observing powers, it fails to secure all the elementary training of which children are capable. It leaves altogether uncultivated the instinct of experiment, which, equally with observation, is an indispensable agent in the acquisition of physical knowledge. A child may become a proficient in Descriptive Botany and remain ignorant of the action and reaction of forces, and of the relation between cause and effect. Yet this knowledge as a means of quickening mental effort is of even more value than any that can be obtained from observation alone, and tends more directly to form the scientific mind. Children are always delighted with experiments, especially with those which they make themselves. They like to set objects in motion, and to watch the results.

The elementary discipline, then, which is to be a continuation of Nature's method, should provide a systematic training in the doctrine of forces.* This training will be one day recognised as the true basis of that Technical Education which is the desideratum of our times.

We are not yet furnished with a systematic arrangement of means and agencies for such training, but in the meanwhile a typical and theoretical specimen is here given of the manner in which instructions of this kind might be conducted; which will also serve as an illustration of the principles already insisted on.

It may be premised that the object of this specimen of a lesson is to show:—

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* That such knowledge is within the comprehension of children is shown with admirable tact and skill in Miss Edgeworth's "Harry and Lucy," as well as by the numerous actual experiments in education recorded in Mr. Edgeworth and his daughter's joint work on "Practical Education." It is much to be regretted that these valuable works, superseded by none in recent times, are apparently falling into oblivion. When the nature and requirements of elementary training are better understood, and our traditional routine submitted to the test of educational science, teachers will study with deep interest the numerous experiments in education which are minutely described in them, and recognise the sterling merits of the Edgeworthian method

(1.) That the pupils throughout the lesson are learning, *i.e.*, teaching themselves by the exercise of their own minds, without, not by, the explanations of the teacher.

(2.) That the pupils gain their knowledge from the object itself, not from a description of the object furnished by another.

(3.) That the observation and experiment by which their knowledge is gained are their own observation and experiment—made by their own senses and by their own hands; as investigators seeking to ascertain for themselves what the object before them is, and what it is capable of doing.

(4.) That the teacher recognises his proper function as that of a guide and director of the pupil's process of self-teaching, which he aids by moral means but does not supersede by the intervention of his own knowledge or explanations.

Suppose, then, a large working model of the pile-driving machine placed in view of the whole class. As it is well known it is not necessary to describe it. The resistance of the earth may be represented by a socket made of boards connected by strong springs.

I. The teacher simply remarks that the object before them is called a "machine," and that its purpose is to drive the pile into the socket which represents the earth. He also tells them the names (merely as conventionalities which they cannot find out for themselves) of the "monkey," the "clutch," the "pulleys," &c. The children are eager to see what the machine can do. He therefore directs two of them to lay hold of the cords and pull up the weight or "monkey." This they do gradually until the clutch relaxes its hold, and the weight falls down on the head of the pile. The weight is then replaced in its original position, and all the children in succession make the experiment. This employment of their own powers involves a personal experience of resistance to muscular effort, and a rudimentary idea of force.

The teacher next directs them to measure the height from which the weight falls, as well as the height of the head of the pile from its insertion in the socket. He also detaches the monkey from the clutch, directs them to weigh* it, and he records the result on the blackboard.

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* Arrangements for accurately weighing and measuring should always form a part of the school apparatus, and should be used not for, but by the pupils. They should also be practised in poising weights in their hands, and in conjecturing heights and distances by the eye, and then comparing the mental surmise with the facts, as ascertained and confirmed by actual experiments.

He then replaces the weight in its original position, and directs the children to repeat the experiment; but this time the height of the pile is measured after the fall of the monkey. and the difference recorded on the blackboard. "The iron weight of — lbs. drives the pile into the earth — inches."

He next substitutes for the iron weight masses of equal volume made of lead and wood, directing the children in each case to weigh the several masses and recording for them the several results of the impact.

Teacher. Which weight drives the pile most, which least?

Answer. The leaden one most, the wooden one least.

T. Why?

A. Because the leaden one is the heavier and the wooden one the lighter.

T. How many inches in each case?

A. The leaden one — inches, the wooden one — inches.

T. What are the weights of each?

A. The leaden one weighs — lbs. the wooden one — lbs.

T. How do you state the result?

A. The leaden weight drives the pile twice as deep as the wooden one.

T. Measure exactly the leaden and the wooden weights; the length, height, and thickness of each. What is the result?

A. They are exactly the same size.

T. We will say that they are of equal *volume;* yet being of equal size or volume, and falling from the same height, you say that the leaden weight produces twice as great a result as the wooden one.

A. Yes, because it is twice as heavy. We found that it weighed twice as much.

T. That is, as you told me, the leaden monkey weighed, say 20 lbs., and the wooden one 10 lbs., both having the same volume.* How do you account for this?

A. We don't know how it is.

T. Well, here is some wool. Weigh out two parcels of it which

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Much valuable mental discipline, as well as preparation for the business of life, is involved in processes of this kind. The vague evidence often given in courts of law on such points shows how much they are neglected in early training.

* The teacher may legitimately aid his pupils by summing up and keeping before them the results they gain; that is, in the intellectual chase in which they are engaged, he may, if he thinks fit, carry the game-bag for them. This will often be found a great support to the attention.

shall be exactly equal to each other. Take one parcel and squeeze it gently into a ball, squeeze the other parcel also into a ball tightly, so that the one ball shall have as nearly as possible double the volume of the other. What do you notice?

A. That the quantity of wool is in both cases the same, but that in the one case it is packed twice as closely as in the other, so that it occupies only half the space.

T. We will call the wool, as being something that we can see, touch, and smell, *matter*, and the "close packing" *density*. How do you apply these terms?

A. The quantity of matter in the two balls is equal, but the density of one is twice as great as that of the other.

T. Now returning to the case of the leaden and wooden weights, how do you account for the fact that though equal in volume, the one weighs twice as much as the other?

A. In the leaden weight, the matter is twice as closely packed or twice as dense as in the wooden one.

T. Now, again. What was the effect of your squeezing the parcels of wool?

A. To bring the bits of wool closely together.

T. Call these "bits" *particles*. Why is it possible to bring them closer together?

A. Because there are spaces between the particles.

T. These spaces are called *pores*, and the fact that there are such pores, is called *porosity*. What relation has this quality to that of density?

A. It is the opposite to *density*. The more dense anything is, the fewer pores it has; the more pores it has the less dense it is.

T. How can you express this generally?

A. The greater the porosity, the less the density; the greater the density, the less the porosity.

T. Terms like density and porosity thus related to each other, are called *correlative*, and we may therefore speak of the *correlation* of density and porosity.

II. The teacher now shifts the beam; arrangements having been previously made for raising or lowering it. The experiments are repeated. The beam is gradually lowered, and the results recorded as before, until there is no height to fall from—the weight simply resting on the head of the pile.

T. What did you observe as the height was gradually lessened?

A. That the pile was less and less driven down.

T. Why was this?

A. Because the monkey did not fall so far.

T. But if the weight is the same, why do the results differ?

A. It is the falling of the weight that makes the difference.

T. This "falling" is called *motion*—what is it, then, which produces the result?

A. The motion of the weight.

T. Let us call the weight, as producing an effect in driving the pile, a *force*. What is it when actually driving the pile?

A. A moving force.

T. A moving force is called *momentum*. What is it made up of?

A. Motion and weight.

T. In what way could you drive the pile down without the motion of the weight?

A. By making the weight a good deal heavier.

T. What advantage, then, is gained by making the smaller weight do the work.

A. It is much more convenient; the smaller weight does as much work by its motion as a larger one would do without motion.

The teacher now detaches the monkey and substitutes one-half the weight; he directs the pupils to experiment with this as they did with the first, and to measure the result; then to attach the original weight so that it may fall from half the original height, and to compare the results.

T. What is the momentum in these two cases?

A. The same.

T. State the result.

A. The weight of — lbs. falling from a height of — feet produces the same effect as the weight of — lbs. falling from half the height. The greater fall makes up for the smaller weight.

T. Mention other instances of momentum.

A. A battering ram, a cannon-ball, a marble shot at another, a stone breaking a pane of glass, a hammer driving a nail, &c.

T. You spoke just now of the falling weight as a "moving force." May the weight acting by itself without motion also be a force?

A. Yes; if it were placed upon an apple it would crush the apple.

T. What other kinds of force can you mention?

A. The wind is a force when it blows down a tree; water is a force when it moves the water-wheel of a mill; gunpowder is a force when it explodes and bursts a rock to pieces, or when it drives a cannon-ball through the air; our strength is a force when we pull up the monkey, &c.

III. The teacher now directs the pulleys to be removed and the weight to be pulled up without them. The children are at once sensible of the increased difficulty.

T. What difference do you now perceive in your pulling?

A. We are obliged to pull harder than we did before.

T. Why is that?

A. Because the rope rubs on the edge of the board, which does not give way; when it moved on the pulleys, the pulleys gave way.

T. This rubbing is called *friction.* Could you lessen it without using the pulleys?

A. Yes, by putting some grease on the edge of the board.

T. Try that.

The experiment is made accordingly, and the rope of course moves more easily; the pulleys are then replaced.

T. What, then, is the use of the pulleys here?

A. By giving way they lessen the amount of friction.

IV. The teacher restores the apparatus to its first condition, and directs the children to notice especially the fall of the weight.

T. Why does the weight fall?

A. Because the clutch opens and lets it go.

T. But why does it *fall*?

A. Because every heavy body falls down of its own accord to the earth.

T. Give other instances of falling bodies.

A. If we throw a stone up into the air it falls down, if we let go when we are climbing up a tree we fall down, &c. The earth seems to pull everything down to itself.

T. This pulling force is called *gravitation*, or *the attraction of gravitation.* What makes the weight fall when it is left free?

A. The attraction of gravitation.

T. Describe it in this case.

A. The earth attracts the weight, and the weight falls by the attraction of gravitation.

T. Look carefully at it as it falls. Does the attraction increase or lessen?

A. It seems to increase. The weight falls faster and faster.

T. Swiftness of motion is called *velocity.* How do you apply the term here?

A. The velocity increases as the weight gets nearer and nearer to the earth.

T. A velocity which increases is said to be *accelerated.* How do you apply the term to the case before us?

A. The attraction of gravitation causes a body left free to fall, to fall towards the earth with accelerated velocity.

T. But how much is the velocity accelerated?

A. We cannot tell, the weight moves so very fast.*

V. *T.* A thing that makes a change in another thing is called a *cause*, and the change itself is called an *effect.* What instances of cause and effect do you perceive in the action of this machine?

A. The pulling of the rope causes the weight to rise, the letting go of the weight causes it to be left free, the attraction of gravitation causes it to fall, and the momentum of the weight causes the pile to go down.

T. What was the first cause which led to all the others?

A. The strength of our arms.

T. Tell me the causes separately.

A. 1. The strength of our arms. 2. The setting the weight free. 3. The attraction of gravitation which gave the weight its momentum.

T. Now tell me the effects separately.

A. 1. The lifting of the weight. 2. The setting the weight free 3. The blow upon the head of the pile.

VI. *T.* Now I will read to you from a book some descriptions, which are called *definitions*, of a few of the special words called *technical terms*, which we have been using.

1. "A machine is a contrivance for applying or regulating a moving power or force." Explain this by what you know.

A. The moving force is the weight falling down; it is applied to the head of the pile; and it is regulated by making the weight heavy enough to do the work well, and by letting it fall exactly on the top.

T. Here is another definition.

2. "The force exerted by a mass of matter in motion is called, in mechanics, momentum or moving force." Explain this.

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* The teacher may, if he sees fit, put many more questions on the phenomena of falling bodies, and even introduce Attwood's machine to the notice and investigation of his pupils, who will be found quite capable of comprehending its action. In reply to an objection that has been made to the use of costly machines in common schools, the writer would suggest that they might be let out on hire, and passed on from school to school as required. The expense in this way would be trifling, while the benefit would be very great.

A. The mass of matter in motion is the weight, and it exerts its force in driving the pile.

T. Here is a third definition.

3. "Friction or rubbing is the resistance which a moving body meets with from the surface on which it moves." Explain this.

A. The friction of the rope against the board when the pulleys were taken away prevented us from pulling up the weight easily.

The teacher may give at will more or fewer of these definitions, but will require in each case that the explanation of the pupil shall be founded on the facts that he knows. This condition is indispensable. A definition founded on facts which he does not yet know, is no definition to him. This consideration suggests the expediency of endeavouring to obtain from him in his own language, however imperfect, the expression of the ideas which he has gained from the facts with which he has been dealing, *before* the definitions of others, founded on the same or similar facts, are brought under his notice. The teacher closes the lesson by directing every pupil to write down the definitions, as he may remember them, each on a separate page of a book set apart for the purpose, with a view to placing under them the new cases which may afterwards occur, as additional illustrations. He adds, in dismissing the class: Let each one contrive some other machine for doing the same work, and bring a model or drawing of it for the next lesson."

The next lesson will consist of a repetition of the main points of the first, with an examination into the action of the clutch, more experiments on velocity, momentum, friction, &c., as shown in other machines and in common operations known to the children. The products of their own invention will then be brought forward and submitted to the criticism of the class, guided by the teacher, who in his turn, may give his own inventions, and submit them to criticism. The definitions, too, will be repeated and tested by the facts. In the third lesson the teacher, *having removed the machine out of sight,* will examine the class upon the *ideas* they retain of its form, operations, &c., as well as on the technical terms which they have learnt, and finally exhibit a well-executed drawing of the machine, which is forthwith to take its place on the walls of the schoolroom.

The first sentence in the language of machines has now been to some extent learnt—learnt as a whole and in its principal parts; its clauses, many of its words, and some of its letters appreciated. It is the *point de départ* from which the pupil sets out in the acquisition of fresh knowledge of the general subject, and to which all that knowledge is to be continually referred. It is the "quelque chose" of Jacotot's famous maxim, "Apprenez quelque chose et rapportez-y tout le reste."

In reflecting on the principles involved in this lesson, we notice—

1. That the learner has throughout had his mind brought into direct contact with material substances and phenomena at first hand; these he has himself seen, handled, and experimented upon, and in so doing has gained mental cognitions and experiences more valuable than any that he could have gained by descriptions of them or commentaries upon them furnished by others.

2. That the method he has employed is the true method of analytical investigation, and proceeds from the whole to the parts, from the complex to the simple, and not *vice versâ.*

3. That by being an observer, explorer, and experimenter on his own account, examining things with his own senses, and employing his own intellect directly upon them, the ideas that he gains respecting them are clear and definite as far as they go, and serve as a solid substratum for those which he is afterwards to associate with them.

4. That he learns to use words as the symbols of things that he knows, technical and conventional terms being supplied, when, and not before, they are needed to facilitate the operations of the mind.

5. That the habits of mind acquired by the process of teaching himself in this special case are such as prepare him for independent mental self-direction, and therefore for the successful study of other subjects, literary as well as scientific.

We also notice (6) that the teacher, while really the mainspring of the educational machinery—all along supporting its movements by his moral and intellectual influence—acts strictly as the superintendent of the processes on which its efficiency depends. He removes, when necessary, hindrances out of the way, and places the workers in the best position for accomplishing their object, but he carefully abstains from doing any part of the work for them. He directs their action but does not interfere with it. He therefore explains nothing, and tells nothing, except technical terms, which, as being conventional, the children could not find out for themselves. He uses no book, but treats the machine as a book, which they are to learn to read for themselves under his direction.

Opinions will of course differ as to the value of this typical first lesson in mechanics. It may be said that the information gained by it is very small, and might more easily have been given by the teacher. A full reply to this objection would be a mere repetition of the principles already stated. It must, however, be remembered, that mental training—the direct object in view—does not consist in giving information, but rather in stimulating the mind to gain information for itself. The act of gaining it by a mental effort involves and *is* the training of the faculties. In the lesson just described, whatever knowledge was gained was the direct result of the pupil's own observation and experiment, through the teaching of the machine—not through the didactic teaching of the instructor. The pupil was an original investigator, applying all his powers to ascertain what the machine was and what it could do, and the teacher was a superintendent or director of the process, anxious to make it as fruitful and efficient as possible. As the head teacher—the machine itself—was at hand, ready to interpret itself in the expressive and forcible language of facts, the subordinate recognised his own proper function, as the director of the process of interrogation, but not the interpreter of the answers. To have assumed this office would have been an injurious interference with the instruction efficiently conducted by his principal. We see, then, in this lesson a typical specimen of a process by which the pupil teaches himself, that is, learns without the explanations of the teacher, and in gaining a certain quantity of knowledge gains also the power of acquiring more.

In some such way as this, maintaining the principle, while varying the form of its application, it is presumed that a solid foundation will be laid for a real training of the mind—a training which will be the best preparation for further instruction, not only in science but also in literature.

It will be thought by some, who may accept generally the foregoing principles, that a needlessly difficult illustration of the theory has been selected, and that it would be better to introduce the subject of mechanics by taking for the first lesson simple levers, &c., and so proceeding from the simple to the more complex—by beginning, in short, at what is usually called "the beginning." The general reply to this objection is (1) that the investigator, inquiring into a new science, strictly speaking, does not know what the beginning is, and cannot, therefore, commence with it—and (2) that the fundamental point in the teaching here recommended is that it requires the pupil to be considered as an investigator. In other words, the process is analytical, not synthetical, and the pupil a student of inductive, not of deductive, philosophy.

His business is to get an accurate knowledge of the facts before him with the view of framing them, as he proceeds, into general propositions, but the logical co-ordination of these propositions into a system is, while he is yet in his noviciate, no part of his business. As he advances in his course, he will rise to higher and higher generalisations, and see more and more clearly the relation of the principles that he has gained, and at last, when he if master of his subject, will arrive at the beginning—and may, perhaps, write a treatise upon it in which all the propositions which constitute the science are logically arranged. Such a treatise, however, will in no sense represent the process by which he gained his knowledge, but rather its exact converse. Hence, a book of this kind is wholly unsuited to the wants of a young investigator who is to gain knowledge as the author gained it. Such books are, however, on account of their logical completeness, often put into the hands of children by teachers ignorant of the science of education, who do not perceive that the very characteristics which give them their value in the eyes of those who are already educated render them unfit for the use of those who are learning how to learn. It is hardly too much to say that scientifically constructed school books, whatever be their intrinsic merit as compendiums of knowledge, ought to be reckoned among the hindrances, not the aids, to early education, and indeed that their real fitness for their purpose is in the inverse ratio of their logical completeness. The knowledge displayed in them may be accurate, the propositions they present unimpeachably expressed—both the matter, in short, and the manner admirably adapted to the prepared mind—and yet they may be, and often are, wholly unsuited to the mind under training. The food is of the best quality, and is artistically cooked, but it is so concentrated that the youthful stomach cannot possibly digest it. The purveyor in this case is surely somewhat to blame for arrangements ending in such results. The fact is, that he has not truly understood the nature of the apparatus which he was directing, and nothing short of a radical change of plan will enable him to correct his error. What this radical change should be has been already indicated.

It appears, then, that scientifically constructed treatises which begin at the beginning—a beginning which is really the end of the investigator's labours—are unsuited to the wants of a child who is to be himself an investigator, and who, in pursuing his process of self-instruction, can only advance from the concrete to the abstract, from particulars to generals, from instances to rules, and who, moreover, has no choice but to advance from the whole to the parts, and then conversely from the parts to the whole. This is, in fact, Nature's method. She does not commence with the elements—with A B C. She supplies no grammar of the senses. She teaches language by giving whole sentences or whole words, and physics by presenting wholes, aggregates, or complex facts, and stimulating the analytic faculty to resolve them into their parts or individual phenomena. The justification, then, for beginning the instruction in mechanics by a machine rather than by the elements of which it is composed, by concrete facts rather than abstractions, is seen to be inherent in the nature of the process recommended. If the child is to investigate facts at first hand, we must imitate Nature by giving him something to investigate which will exercise his analytical powers; something divisible into parts or elements—which, after due recognition as individual elements, will be traced in the composition of other wholes. On the same principle, if he is to learn to frame general propositions himself, he must commence by knowing the facts which they are to express—that is, by induction of particulars. But this practice in forming inductions of his own will be a powerful aid to his understanding the inductions of others founded on the same or similar facts, and will, moreover, prepare him for proceeding in due time, conversely, from general propositions to facts by the method of deduction.

Whether such lessons in mechanics as have been suggested should follow or accompany Miss Youmans's "Lessons in Botany," or whether any other subject involving the notion of forces should be taken instead of mechanics, are questions which must be left to the judgment of the teacher.

Finally, it should be carefully noticed that the spirit of these remarks on elementary teaching will not have been appreciated unless it is fully understood that the change proposed is fundamental—even revolutionary.* It is intended to supersede the didactic, telling, explaining, condescending method which has long prevailed, by one in which the child's own intellect is recognised as the prime mover, and the exercise of his powers of perception and reasoning as the only means by which knowledge which can be truly called his own is to be gained; by a method, in short, of self-teaching, under superintendence—a method which is rather the learner's than the teacher's.* The didactic method has had its day, and we see its results, which are generally "a farrago of facts partially hatched into principles, of exceptions claiming equal rank with rules, of definitions dislocated from the objects they define, and of technicalities which clog rather than facilitate the operations of the mind."† It is not too much then to say that this method quenches instead of quickening mental development. It does not give children credit for the powers they possess, and therefore fails to elicit them. It has nothing in common with that which Burke, in a well-known passage, characterizes as "incomparably the best,"‡ and which recognises even the youngest child as an investigator, who has only to be set on the right path, and to be competently directed, to find out truths for himself.§ It cannot, therefore, be a means of that training of vital forces which, in the case of every human being, as an organism characteristically endowed with will, must, under competent direction, be ultimately wrought out by himself.

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* "The principle of connecting education with the laws of Nature is radical, and is, as yet, little appreciated, and still less worked out. When admitted and carried into practice, it must revolutionise educational procedure, and is, I believe, the only sound foundation for the education of the future, and the only method which can bring education into consonance with the method which has been so successful in scientific investigation." From *a MS. Lecture, one of a course on the Theory and Practice of Education, now being delivered by Mr. Lake, of the College of Preceptors, at the North London Collegiate and Camden Schools for Girls.*

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* Very interesting illustrations of this kind of teaching may be seen in Mr. Wilson of Rugby's description of his method of making a class "teach themselves" physical science (*Essays on a Liberal Education*, p. 281), and in Professor Tyndall's description of the experiments at Queenwood College, in which he got his pupils to "find out Euclid" for themselves; a process by which they gained what he calls "self-power," and learned geometry as a "means and not a branch of education."—*Lecture on the Study of Physics, delivered at the Royal Institution*, pp. 202–204.

† From a paper on "The Correlation of Learning and Teaching," read by the editor at one of the evening meetings of the Social Science Association. Numerous other illustrations and arguments bearing upon the general subject may be also found in his three lectures "On the Science and Art of Education, and Educational Methods," published by the Council of the College of Preceptors.

‡ "I am convinced that the method of teaching [or learning] which approaches most nearly to the method of investigation is incomparably the best; since, not content with serving up a few and barren lifeless truths, it leads to the stock on which they grow; it tends to set the reader [or learner] himself on the track of invention, and to direct him into those paths in which the author [or investigator] has made his own discoveries."—*On the Sublime and Beautiful.* It would be curious to inquire how many English teachers, even those who have acknowledged the general truth of this remark, have ever practically applied it.

§ "Qu'il (the child) ne sache rien parce que vous le lui avez dit, mais parce qu'il l'a compris lui-même; *qu'il n'apprenne pas la science, qu'il l'invente.*"—ROUSSEAU, *Émile.*

The great principles, in short, (1) that knowledge is acquired by investigation, through observation and experiment, and (2) that the acquisition of it in this way, at first hand, constitutes the best training of the youthful mind, are seen to be in direct opposition to that which assumes the incapacity of the child to learn except by means of the direct communication of the teacher's knowledge, accompanied by the teacher's explanations and tellings, and which, therefore supersedes and neutralises the most fruitful employment of the child's faculties. That only is to be considered a fruitful employment of the mental faculties, and as answering the true ends of education, which leads to enlargement of mental view, to the sharpening of the perceptive faculties, to the formation of habits of observing and investigating, to the strengthening of the memory, and generally to the development of intellectual power, not only as an object in itself, but as a basis for moral and religious character.

THE

CURRICULUM

OF

MODERN EDUCATION,

AND

THE RESPECTIVE CLAIMS OF CLASSICS AND SCIENCE TO BE REPRESENTED IN IT CONSIDERED.

Being the substance of two Lectures delivered at the Monthly Evening Meetings of the College of Preceptors, April 11th and May 9th, 1866.

> "Not to know at large of things remote
> From use, obscure and subtle, but to know
> That which before us lies in daily life,
> Is the prime wisdom: what is more is fume,
> Or emptiness, or fond impertinence,
> And renders us, in things that most concern,
> Unpractised, unprepared, and still to seek."
>
> MILTON.

". . . . So each study in its turn can give reasons why it should be cultivated to the utmost. But all these very arguments are met by an unanswerable fact, that our time is limited. It is not possible to teach boys everything.

"If it is attempted, the result is generally a superficial knowledge of exceedingly little value, and liable to the great moral objection, that it encourages conceit and discourages hard work. A boy who knows the general principles of the study, without knowing its details, easily gets the credit of knowing much, while the test of putting his knowledge to use will quickly prove that he knows very little. Meanwhile he acquires a distaste for the drudgery of details, without which drudgery nothing worth doing ever yet was done."—Dr. Temple's *Answer to Questions of the Commissioners on Public Schools.*

"If we are to choose a study which shall pre-eminently fit a man for life, it will be that which shall best enable him to enter into the thoughts, the feelings, the motives of his fellows."—*Ibid.*

"All education really comes from intercourse with other minds. The desire to supply bodily needs and to get bodily comforts would prompt even a solitary human being (if he lived long enough) to acquire some rude knowledge of nature. But this would not make him more of a man. That which supplies the perpetual spur to the whole human race to continue incessantly adding to our stores of knowledge: that which refines and elevates, and does not educate merely the moral, nor merely the intellectual faculties, but the whole man, is our connection with each other; and the highest study is that which most promotes this connection, by enlarging its sphere, by correcting and purifying its influences, by giving perfect and pure models of what ordinary experience can, for the most part, show only in adulterated and imperfect forms."—*Ibid.*

"The classic life contains precisely the true corrective for the chief defects of modern life. The classic writers exhibit precisely that order of virtues in which we are apt to be deficient. They altogether show human life on a grander scale, with less benevolence, but more patriotism; less sentiment, but more self-control; of a lower average of virtue, but more striking individual examples of it; fewer small goodnesses, but more greatness and appreciation of greatness; more which tends to exalt the imagination and inspire high conceptions of the capabilities of human nature. If, as every one must see, the want of the affinity of these studies to the modern mind is gradually lowering them in popular estimation, this is but a confirmation of the need of them, and renders it more incumbent on those who have the power, to do their utmost to aid in preventing their decline."—John Stuart Mill.

"We would have classics and logic taught far more really and deeply than at present, and would add to them other studies more alien than any which yet exist to the 'business of the world,' but more germane to the great business of every rational being—the strengthening and enlarging of his own intellect and character."—*Ibid.*

"In nations, as in men, in intellect as in social condition, true nobility consists in inheriting what is best in the possessions and character of a line of ancestry. Those who can trace the descent of their own ideas and their own language through the race of cultivated nations, who can show that those whom they represent or reverence as their parents have everywhere been foremost in the field of thought and intellectual progress: these are the true nobility of the world of mind: the persons who have received true culture; and such it should be the business of a liberal education to make men."—Anon.

"The ancient classics would not be worse, but better taught in the highest forms, did the pupil receive a more general culture in his early course."—Dr. Hodgson, "*Classical Instruction,*" *an Article reprinted from the Westminster Review, Oct.*, 1853.

"It is the early age at which classical studies are begun that, rendering the work at once tedious and unprofitable, necessitates so terrible an expenditure of time, and prevents their successful prosecution. Difficulties which are now surmounted, if at all, with infinite labour and many tears; details which are now mastered, if at all, by children who can have but little comprehension of their meaning and purpose, and but little motive to mental effort, would afford only an easy and a pleasant exercise to minds more mature and better prepared."—*Ibid.*

"I claim for the study of physics the recognition that it answers to an impulse implanted by nature in the human constitution, and he who would oppose such study must be prepared to exhibit the credentials which authorise him to contravene nature's manifest design."—*On the Importance of the Study of Physics as a Branch of Education for all Classes.* By Professor Tyndall.

"Leave out the physiological sciences from your curriculum, and you launch the student into the world undisciplined in that science whose subject matter would best develop his powers of observation; ignorant of facts of the deepest importance for his own and others' welfare; blind to the richest sources of beauty in God's creation; and unprovided with that belief in a living law, and an order manifesting itself in and through endless change and variety, which might serve to check and moderate that phase of despair through which, if he take an earnest interest in social problems, he will assuredly, sooner or later, pass."—*On the Educational Value of the Natural History Sciences.* By Professor T. H. Huxley.

"J'aime les sciences mathématiques et physiques; chacune d'elles, l'algèbre, la chimie, la botanique, est une belle application partielle de l'esprit humain; *Les Lettres, c'est l'esprit lui-même;* l'étude des lettres, c'est l'éducation générale qui prépare à tout, l'éducation de l'âme."—*Napoleon I., quoted by* Dr. Hodgson.

"Wenn uns unser Schulunterricht immer auf das Alterthum hinweist, das Studium der griechischen und lateinischen Sprache fördert, so können wir uns Gluck wünschen, dass diese zu einer höheren Cultur so nöthigen Studien niemals rückgängig werden."—Göthe.

PREFACE.

THE following pages contain the substance, with some alterations and additions, of two Lectures lately delivered at the College of Preceptors, and the writer seeks by the publication of them the suffrages of that larger audience with which lies the ultimate decision in discussions of this kind.

The question of the curriculum is daily becoming more and more important. The demand that it shall represent, in a far greater degree than it has hitherto done, the wants and wishes, the active energies, and in short the spirit, of the age, cannot be, and ought not to be, set aside. This claim, which involves particularly the pretensions of physical science to be represented in the curriculum, is much strengthened by the consideration that science furnishes, when properly taught, a kind of educational training of special value, as a complement to that of language. The writer has attempted to show that science teaches better, that is, more directly and soundly, than any other study, how to observe, how to arrange and classify, how to connect causes with effects, how to comprehend details under general laws, how to estimate the practical value of facts. Having, however, dealt out this measure of justice to science, he maintains that the difficulties which lie in the way of the attainment of these valuable results, by means of school education, have not yet been overcome; and that even if they were, and science were fully admitted into the curriculum,—which ought to be the case,—that the classical and literary training is better adapted to the development of the whole man than the scientific, and should therefore take the lead. In pursuing this argument, he has been led specially to deal with two fallacies, which, under a variety of forms, are extensively prevalent at present, and, by their evil influence, tend very much to hinder the cause which they are, apparently, designed to promote. The first is, That because there is so much to know in the world we are bound to try to make our children learn it all. The second is, That because there is so much to do in the world we ought to force all kinds of business upon children's attention beforehand, by way of preparation for it; in other words, that the *omne scibile* and the *omne facibile* (to use a barbarous Latin word) ought to be comprehended in every good curriculum of education. If he has succeeded in exploding these fallacies, and in making good his own proposition, that all true education involves, fundamentally, training, and training of a kind that is quite incompatible with the claims of any system in which *accumulation* is the first principle, and *special preparation* the second, he hopes to gain the thanks of all judicious and really competent authorities in science; of all who mean by teaching science training the mind to scientific method, to habits of investigation, and the diligent search after truth.

There can be little doubt that the recent Report on the results of classical teaching in our public schools, and especially in the case of Eton, has done much to strengthen the cause of those who wish to see a reform in the curriculum. Few men, perhaps, at the head of public institutions have ever stood in a more humiliating position than that occupied, about four years ago, by the Head-Master of Eton, who, being under examination before the Commission on Public Schools, could only say, in reply to the following pungent remarks of Lord Clarendon, the chairman, that he was "sorry;"—thus allowing the full force of the charges implied. "Nothing can be worse," said his Lordship, "than this state of things, when we find modern languages, geography, history, chronology, and everything else which a well-educated English gentleman ought to know, given up, in order that the full time should be devoted to the classics; and at the same time we are told that the boys go up to Oxford not only not proficient, but in a lamentable state of deficiency with respect to the classics."

It is not to be wondered at that those who were before discontented with the established course of study in our public schools, became, after such a statement of facts, amply borne out as it was by the evidence, so indignant, as to demand, in the interests of philanthropy, as well as science, that the system which had borne such fruits should be not only degraded, but deposed. This violent reaction cannot, however, be sustained. The abuse must not be confounded with the use. It may be true that very little besides classics is taught at Eton, and that *they* are not learnt; but this is no argument against either the theory or the practice of classical instruction. But while the present writer, who has had long experience in teaching, defends generally that theory and practice, he believes that the time is come for such a modification of its working, at least in middle-class schools, as will admit of the honourable introduction of science into the curriculum. It is then as a friend, and not an enemy, to science, that he has endeavoured to clear the ground of some of the frivolous and damaging arguments which theorists have imported into the discussion, and to plead that it shall be so taught as to make it a real mental exercise. Thus introduced as a co-ordinate discipline, it would prove a most valuable ally in education, and take its proper place among the great elements which are moulding the civilisation of the age.

4, Kildare Gardens, Bayswater,
July 1, 1866.

THE CURRICULUM OF MODERN EDUCATION,

AND THE

RESPECTIVE CLAIMS OF CLASSICS AND SCIENCE TO BE REPRESENTED IN IT CONSIDERED.

FROM the time when the idea was first conceived of interfering with the natural liberty of children, and setting them down on benches or on the ground to "learn," the question of what they should be taught could not fail to be one of great interest. An inquiry into the details of the various curricula arranged for the purpose of instruction by the wise men of the different nations of antiquity, would no doubt elicit much that would be valuable for the purpose of a writer on the History of Education, but opens up far too wide a field for our present limits. It may, however, be observed generally, in passing, that the scientific or practical element seems to have prevailed more in the primary schools of Egypt, India, Phœnicia, and Persia; the linguistic or literary in those of Judea, China, Greece, and Rome. Exception may, no doubt, be taken to this general statement, which, however, I must leave in its vagueness, without even a momentary effort to estimate the comparative value of the various curricula in their relation to the spirit and character of the respective nations which adopted them; and without even contrasting, as educational products, Plato, the pupil of Socrates, on the one side, and Alexander the Great, the pupil of Aristotle, on the other.

Descending, then, as at a leap, to the commencement of the Middle ages, in Europe, we find the *omne scibile* comprehended, for the purpose of teaching, in two groups; the Trivium, consisting of Grammar, Logic, and Rhetoric; and the Quadrivium, of Arithmetic, Music, Geometry, and Astronomy. These subjects were designated by Cassiodorus, the literary adviser and friend of Theodoric, the "seven pillars" hewn out by Wisdom to build her house upon.* The structure, however, then, and for a thousand years after, remained unfinished; and even at this present day it must be acknowledged that Wisdom's house of education is by no means distinguished for symmetrical beauty and completeness. In the rivalry which, not unnaturally, arose between these two courses of study, it would appear that the physical or strict sciences were usually defeated; for, either from indolence or distaste, the foundation of the Trivium, to which precedence in education was considered due, was generally so long in laying that the pupil rarely reached what was then treated as the higher course. Practically, indeed, in the lower schools, no attempt was made to go much beyond "Grammar," which, in connection with the study of Latin alone at first, and subsequently of Greek, with a little reading, writing, and arithmetic, formed the common course for English boys in the fourteenth, fifteenth, and sixteenth centuries. If the curriculum of school education is to be considered as reflecting the spirit of the age, which, however, is not, as we see in our own case, a fair criterion, it would appear that physical science was in those times, if not altogether neglected, at least treated with indifference; for not only in schools, but even in the universities, the quadrivials were, as Harrison remarks, "smallie regarded."* This state of things, continuing almost unaltered to the seventeenth century, roused the indignation of Milton, who denounces "the hailing and dragging of our choicest and hopefullest wits to that asinine feast of sowthistles and brambles, which is commonly set before them as all the food and entertainment of their tenderest and most docible age;" while Cowley, rather later, pleads for the initiation of children into "the knowledge of things as well as words, and for the "infusing knowledge and language at the same time into them." Both these eminent men constructed schemes, on paper, for revolutionising the existing curriculum in accordance with their views. Inasmuch, however, as they were in no respect themselves the fruit of the system they advocated, nor recommended it (I allude specially to Milton) by their own practice, the public generally seems to have attached little importance to their views, and certainly showed no desire to adopt them.

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* "Wisdom hath builded her house: she hath hewn out her seven pillars." (Prov. ix. 1.)

After their days, the established system was occasionally complained of (notably by Locke and Clarke, and more recently by Sydney Smith); but within the last fifty years various causes have tended to strengthen the assailants and give piquancy to the strife; and at the present moment, more than ever before, the advocates of the old and new systems respectively are pertinaciously presenting their claims to the arbitration of the public. The maintenance of a hostile feeling is, however, much to be deprecated. This question may be, it is hoped, dispassionately discussed; and for myself, though advocating the retention of much of the old system, I am, as will be seen, strongly impressed with the great claims of science, and disposed to recommend a fair and liberal compromise. I cannot but think that a curriculum framed in such a way as to retain the sound discipline of the old classical course, and to embrace the vivifying influences of the scientific element, would prove advantageous to both. Science, judiciously and thoroughly taught, supplies a training of a different kind from that supplied by classics, and of a kind especially adapted to correct the defects of the latter. This has been, indeed, to some extent, admitted by the general introduction of mathematics into the curriculum. It will, however, be shown that pure mathematics are not sufficiently comprehensive for the purpose. The observational and experimental sciences, besides being more generally inviting as a study than mathematics, are recommended, too, by their much closer connection with the interests and happiness of mankind. The fact cannot be denied that our general school curriculum includes much that is not practically available in the world for which it is by theory a preparation, and excludes much that is; that it rests mainly on the traditions and experience of the past; and that it does not appear to keep pace, *pari passu*, with the actual life, the feelings, and hopes, and aspirations of the present. If these admissions, literally interpreted, are to be considered sufficient causes for condemnation, the question is at once decided, and society has only to order the delinquent for execution without delay. Before, however, the matter is thus summarily disposed of, the defendant should, and indeed must, in all fairness, be allowed to plead his cause at the bar of reason and common sense. In the case of this as of other time-honoured institutions, it will probably be found that we are not so very much wiser than our fathers as we may at first sight be disposed to flatter ourselves. The very fact of the antiquity of an institution is, at all events, a respectable plea, and should not be wantonly rejected. It must, however, be admitted that this plea has not in our day the strength which it once had. Old institutions, of whatever kind, are now required to *prove* that they deserve to live, if that privilege is to be allowed them.

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* Harrison's "Description of England," prefixed to Holinshed's Chronicle, 1577.

In the case before us, we have an extreme party of reformers, who without hesitation declare that the proper place for classical instruction in the curriculum is no place at all—who would not only dethrone it from the position it has so long held, but thrust it ignominiously forth. This is the not unnatural reaction against the unwarrantable assumption on the other side, that the proper place of classics in the curriculum is the whole curriculum; that they alone constitute "learning;" and that the most honourable and lucrative positions in society ought to be allotted, as a matter of course, to those who hold *their* certificate. Exaggerated pretensions, however, on whichever side they are held, only injure the cause of those who maintain them, and in the present case are especially unsuitable. For, as between the rival claims of language and literature on the one side, and science on the other, there is surely much to be said for both so true and so reasonable as to claim the respectful attention of all fair and competent judges. It must never be forgotten that out of those ages in which science, properly so called, was unknown, came forth the great teachers of mankind, the pioneers, nay, more, the efficient agents, by words and deeds, in originating and carrying on the civilisation of the human race. This important work was accomplished by men utterly unacquainted with geology, the steam-engine, the electric telegraph, spectrum analysis, or the dynamic theory of heat. Without these means and appliances, or even an atom of the spirit of which they are the fruit,—without any of the enthusiasm of modern physical philosophy,—statesmen and warriors, heroes, patriots, and artists, of whom all ages are proud, have so lived as to leave an imperishable name behind them. Whether the age of science will produce grander results has yet to be proved. On the other hand, it is most reasonable that science too should, in our day especially, claim its proper place in education as a civilising agent. It may point with pride to what it has done and is doing, and may without rebuke exclaim: "If you need memorials of my power and influence, look around you; the results are everywhere. Nay more, if, instead of mere details, dry facts, and practical applications, you have a taste for sublime speculations and theories, I can furnish you with views into the distant and the past almost unequalled for elevation, range, and depth, and fraught with the profoundest interest to the present and all future generations." We may, therefore, without slavish humility, bow reverentially before both these claimants on our homage, and denounce impartially the zealots and fanatics on either side,—the men who audaciously declare that scientific instruction is "worthless," and equally those who stigmatise the classics as "useless,"—in the curriculum of modern education.

In dealing with the subject of my lecture, I propose, in the first place, to consider generally the curriculum of modern education for the middle classes, and to discuss some of the plans proposed for its reformation; and secondly to advocate the claims of classical instruction to continue to hold the leading place in it as a mental discipline.

The object we have in view is to discuss the curriculum of modern education, as far as the *middle classes of society* are concerned—excluding, on the one hand, those whose instruction must, from circumstances, be limited to the barest elements of learning; and those, on the other hand, whose course is intended to terminate in a university career. The question then is—considering the age in which we live, with its immense accumulation, and wonderful applications, of knowledge; considering, too, that the longest life is too short for securing for the individual man any large portion of this, which constitutes the treasury of the race; and that the immature faculties of the child can grasp only a very limited portion of that which is ultimately attained by the man—whether we do wisely in giving up any considerable portion of the small space of time available for acquisition, to the attainment of a kind of knowledge which appears, in comparison with scientific and general information, to be only slightly demanded by the wants and the wishes of the age. *If* it is necessary, or even important and desirable, that *we should all attempt to know all things*, this question is at once settled by the exigencies of the case. Every moment of the time devoted to instruction must, on that assumption, be given up to the earnest and unremitting pursuit of the "things that lie about in daily life;" and everything which impedes or interferes with that pursuit must be regarded as impertinent. It is, however, perfectly clear, that the attempt to force the individual man to keep up with the intellectual march of the human race must end in utter disappointment; and, moreover, involves a fatal misconception of the object which all true education should have in view. It cannot be too frequently repeated, that development and training, and not the acquisition of knowledge, however valuable in itself, is the true and proper end of elementary education, nor too strongly insisted on, that he who grasps too much holds feebly, or, as the French pithily expresses it, *qui trop embrasse mal étreint*. The fact that there is a vast store of knowledge in the world is no more a reason why I should acquire it all than the fact that there is an immense store of food is a reason why I should eat it all. We may mourn over the limitation of our powers, but as our fate in this respect is quite inevitable, it is our duty, as rational creatures, to submit to it, and to be satisfied with doing, if not all that we fondly wish, yet all that we can, and, what is more important, as well as we can. I cannot but think that the protest of the high-minded and conscientious men who are in our day aiming at the reform of the school curriculum, would be much more influential with the public if they would keep closely to the true issue in discussing this question. It is most desirable, certainly, that there should be a thorough reform; but it is equally desirable that the reform should be established on a sound basis, and that both parties should co-operate in arriving at a wise decision on this point.

It is much to be regretted that so many of those who have handled the subject of the curriculum in the interests of philanthropy, should be disqualified from treating it judiciously by a want of practical acquaintance with education. Very much at their ease, they construct airy and fantastic theories, founded not on what is practicable, but what is desirable; recommend them earnestly, as if they were the genuine fruits of experience, and too frequently reproach the hard-working teachers, who, however much they may admire such theories, cannot by any amount of labour realise them, and therefore feel themselves aggrieved at having their actual educational product unfairly brought into comparison with the highly-coloured results promised by the theorist. These writers, men, if you will, of benevolent hearts, certainly of lively imaginations, evince far too little sympathy with the actual work of the practical teacher, with his arduous, long continued, little appreciated toils, his never-ending struggle against the natural volatility, ignorance, dulness, obstinacy, and sometimes depravity, of his pupils, and comprehend not the true vital organisation of that "pleasing, anxious (professional) being," which perhaps, after all, no earnest teacher ever resigns without some "longing, lingering look behind."

Two leading principles seem to characterise most of the theories which have been, in modern times, proposed for the reform of the old curriculum. The first is, that the curriculum ought to be considered as a counterpart or reflex of the world of knowledge to which it is introductory, and that therefore the *omne scibile* of the latter should be represented in the former. The other principle seems to be, that as men are often found "unpractised, unprepared, and still to seek," in regard to the circumstances in which they are actually placed in life, we should anticipate this difficulty by making children acquainted beforehand with "the leading kinds of activity which constitute human life"—in other words, with all varieties of practical business. In enforcing both these views, touching appeals *ad misericordiam* are made by their supporters, based, first, on the cruelty of withholding from the child that knowledge of science which has become the inheritance of the race, and which he so much desires to have; and again, on the criminal neglect of his teachers in not securing him, by ample knowledge of practical business, against the dangers into which, from ignorance and inexperience, he is not only likely, but certain, to fall. The theory, then, stated in its bare simplicity, is, that the boy is to be provided by his education, first, with *all scientific knowledge;* and secondly, with *all practical knowledge,* as his proper equipment for the battle of life.

That I may not, however, be suspected of misrepresenting these theoretical views of the curriculum, I will now endeavour to exhibit them, as taken from the works in which they are to be found.

In the first number of the "Westminster Review," published in 1824, we find an article mainly devoted to the explanation and enforcement of Mr. Bentham's "Chrestomathia"* as a scheme of instruction which (to use the reviewer's words) should "comprehend the various branches of education which are spread over the whole field of knowledge, giving to each its due share of importance with a view to the greatest possible sum of practical benefit." It is curious to see the course of study proposed by Bentham, and which has been extended by the enthusiastic Mr. Simpson, in his work entitled "The Philosophy of Education."

The subjects proposed for the Chrestomathic curriculum of study in the case of boys, and girls, too, "between the ages of seven and fourteen," are as follows:—

Elementary Arts.—Reading, writing, arithmetic.

1st Stage.—Mineralogy, botany, zoology, geography, geometry (definitions only), history, chronology, drawing.

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* "Chrestomathia: being a Collection of Papers explanatory of the Design of an Institution proposed to be set on foot, under the name of the Chrestomathic Day-Schools, or Chrestomathic School, for the Extension of the New System of Instruction to the Higher Branches of Learning, for the use of the Middling and Higher Ranks of Life." By Jeremy Bentham, Esq. London: 1816.

2nd Stage.—Same subjects with mechanics, hydrostatics, hydraulics, pneumatics, accoustics, optics.
Chemistry, mineral, vegetable, animal.
Meteorology, magnetism, electricity, galvanism, balistics.
Archæology, statistics.
English, Latin, Greek, French, and German grammars.

3rd Stage.—Subjects of previous stages, and mining, geology, land-surveying, architecture, husbandry, including the theory of vegetation and gardening.
Physical economics—*i.e.*, the application of mechanics and chemistry to domestic management, involving "maximization of bodily comfort in all its shapes, minimization of bodily discomfort in all its shapes," biography.

4th Stage.—Hygiastics (art of preserving and restoring health), comprising physiology, anatomy, pathology, nosology, dietetics, materia medica, prophylactics (art of warding off evils), surgery, therapeutics, zohygiastics (art of taking care of animals).
Phthisozoics (art of destroying noxious animals: vermin-killing, rat-catching, &c.).

5th Stage.—Geometry (with demonstrations), algebra, mathematical geography, astronomy.
Technology, or arts and manufactures in general.
Book-keeping, or the art of registration or recordation.
Commercial book-keeping.
Note-taking.

Such is the scheme of the Chrestomathia, which designedly omits (as Mr. Bentham tells us) gymnastic exercises, fine arts, applications of mechanics and chemistry, belles lettres, and moral arts and sciences. These are omitted on various grounds, which I have no time to specify, except to mention one, which might indeed have very suitably excluded five-sixths at least of those enumerated —" time of life too early."

Mr. Simpson, approving of the whole of the above curriculum, thought it still incomplete, and therefore introduced the department of Moral Science, omitted by Bentham, as a

6th Stage.—History, government, commerce.
Political economy.
Philosophy of the human mind.

Risum teneatis amici! Was anything more extraordinary ever proposed in the whole history of man? This imposing display of the triumphs of the entire human race is actually presented as a curriculum of study for children between *seven and fourteen years of age!*

Such is the scheme lauded by a writer who complains that "hitherto the education proper for civil and active life has been neglected, and nothing has been done to enable those who are to conduct the affairs of the world to carry them on in a manner worthy of the age and country in which they live, by communicating to them the knowledge and the spirit of their age and country." This is the panacea, then, proposed by the Chrestomathic school for the cure of the educational maladies of the day. Education, according to this view, is to consist in the administration of infinitesimal doses of knowledge: a little drop of this, a pinch of that, an atom of the third article, and so on; the names and technicalities of a great range of subjects, and mastery and power over none. Comment on such a scheme is unnecessary. It condemns itself as a method of teaching superficiality and sciolism on system. Is there any connection between such a course and "the complete and generous education" (these are Milton's words) that "fits a man to perform justly, skilfully, and magnanimously, all the offices, both private and public, of peace and war?" Are we not rather injuring than aiding true mental development, and perhaps moral too, by pretending to teach the sciences when all the while we are teaching little beyond their names? Is such a scheme as this to supersede the sound instruction and invigorating discipline of the old school? Is this the desideratum so eagerly looked for as a means of producing men capable of carrying on the affairs of the world in "a manner worthy of the age and country in which we live?" I quite agree with the most advanced of the reformers in question as to the need of reform; but I hope they will agree with me that this is not the direction in which it is to be promoted, and that if the new crusade is to be successful in its objects, Messrs. Bentham and Simpson must not be permitted to head the movement.

Another theoretical writer on modern education is Mr. Herbert Spencer, who, in his work entitled "Education, Intellectual, Moral, and Physical," has presented us with a scheme—evolved apparently out of the depths of his own consciousness; for he does not profess to have any practical experience as a teacher or schoolmaster—so ingenious, and pretty, and complete, that one can only sigh over the limited capacity of human nature, which will, it is to be feared, for ever prevent its being realised. While agreeing for the most part with Mr. Bentham, that a child can and ought to learn—at least, what he calls learning—an immense number of subjects, he insists with great earnestness upon the principle (which, if rightly interpreted, no one questions) that education should prepare the pupil for the duties of life; or, as he styles it, for "the right ruling of conduct in all directions, and under all circumstances." This, as he remarks,—and every one will agree with him,—is the "general problem, which comprehends every special problem; and he goes on further to tell us, that the solution of it involves our knowing "in what way to treat the body; in what way to treat the mind; in what way to manage our affairs; in what way to bring up a family; in what way to behave as a citizen; and in what way to utilise those sources of happiness which nature supplies; how to use our faculties to the greatest advantage of ourselves and others; how to live completely. And this, being the great thing needful for us to learn, is by consequence the great thing which education has to teach."

This is an epitome of Mr. Spencer's views on the curriculum, and it appears to be impossible to satisfy the conditions of his theory by anything short of special preparation for all the contingencies of life. My limits will not allow of a close investigation of arguments and illustrations, spread over nearly sixty pages of his book; but a practical schoolmaster has surely some right to inquire whether he is serious in adducing, as evidences of defect in the school curriculum, numerous instances of persons injuring their eyesight by over-studying, and their limbs by over-exercise; of others suffering "from heart-disease consequent on a rheumatic fever that followed reckless exposure;" and again, of "the engineer who misapplies his formulæ for the strength of materials, and builds a bridge that breaks down;" of the shipbuilder who, "by adhering to the old model, is outsailed by one who builds on the mechanically-justified wave-line principle;" of the bleacher, the dyer, the sugar-refiner, the farmer, who fail more or less, because unacquainted with chemistry; and notably of the mining speculators, who ruin themselves from ignorance of geology; and the constructors of electro-magnetic engines, "who might have had better balances at their bankers" if they had understood "the general law of the correlation and equivalence of forces." Are all these sad delinquencies, and many more, recounted with terrible accuracy by Mr. Spencer, fairly to be laid to lack of service and duty and sense in the schoolmaster? Ought the elementary schoolmaster—that is the real question—to have furnished all his pupils of from seven to fourteen years of age with the knowledge and judgment, and common sense and experience, which are the proper safeguards against the failures I have enumerated? I answer distinctly, that he is not responsible; and I might say this much more strongly, but that I respect Mr. Spencer's earnestness and true sincerity of purpose. But Mr. Spencer, who is no schoolmaster himself, having, it would appear, a most exalted opinion of the omnipotent and omniscient faculties of that functionary, demands still something more of him, and regarding it as "an astonishing fact, that not one word of instruction on the treatment of offspring is ever given to those who will by-and-by be parents," that is, given by the schoolmaster, lays that obligation also upon him. Here, too, it appears to me, the practical schoolmaster has a right to ask, very specifically, what kind of information "on the treatment of offspring" Mr. Spencer would himself propose to give, as a sort of model school lesson, to a child of twelve or fourteen years of age? The child is, to be sure, in a certain sense, "the father of the man," but it is coming down rather sharply upon him to apply this literally, and make him leave his tops and balls so early in life, and set about this unseasonable preparation for the duties of paternity.

The general conclusion, then, from our review of Mr. Spencer's theory, is, that its due satisfaction involves the assumption that every man is to be his own doctor, lawyer, architect, bailiff, tailor, and, I suppose,—clergyman; so that the Chrestomathic scheme, which required the child to learn the *omne scibile*, is supplemented, as not being comprehensive enough, by Mr. Spencer's, for learning also the *omne facibile*;* and both must, I fear, be condemned, not only as being utterly impracticable (though that might be a sufficient objection), but as being based on a total misconception of what elementary education ought to be.†

The fact is, that however captivating to the imagination the idea may be of communicating to our pupil those immense stores of knowledge, the possession of which distinguishes the present from all previous ages, it is one which, when brought to the test of experience, proves utterly illusory. A higher power than that of either the theoretical educationist, or the practical schoolmaster, has ordained that into the kingdom of knowledge, as into the kingdom of heaven, we must enter as little children. We must begin at the beginning, and learn the *prima elementa* each for himself, as all children before us have done, gaining little advantage as individuals from the achievements which science has effected for our race. We find, too, that if, from a desire to spare our pupil the labour of learning fact after fact in apparently endless succession, we frame compendious formulæ, rules, and general principles, founded on other men's mental experience, and endeavour to feed his mind with them, they prove, in the early stage of instruction, utterly indigestible, and minister no proper nourishment for him. Mr. Spencer, in another part of his book, justly remarks: "To give the net product of inquiry, without the inquiry that leads to it, is found to be both inefficient and enervating. General truths, to be of due and permanent use, must be earned."

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* This phrase is, I am aware, non-classical. It is, however, to be found in Ducange.

† See Appendix, Note A.

The same principle would seem to decide the question of special preparation. The experience of those who have gone before us cannot supersede our own; and no conceivable improvement, therefore, in the curriculum will ever provide for "the right ruling of conduct in all directions, under all circumstances;" or, in other words, furnish a child beforehand with the mental and moral powers which are to be developed in the actual life of the man. It is by living that we learn to live.

I have already suggested, that development and training, not the acquisition of knowledge, however valuable in itself, is the true and proper end of elementary education. In a general way it may be asserted that the former is the main tenet of the old or conservative, the latter of the new or reforming, school. We shall have to dwell at some length on this point, that we may be prepared to recognise the respective claims of various subjects to be admitted into the curriculum. It is perfectly true that neither view of necessity excludes the other. Any subject, however suitable in itself for the discipline of the pupil, may be so taught as to involve no good training; and a subject presumptively unsuitable may, by the skill of the teacher, be made to yield the happiest fruits. Still the prominence given to these respective features in theory must materially affect the practice founded on them. I need not refer to the very etymology of the word "education" to support the more old-fashioned view of the case. All will allow that it means training or development; but I would dwell for a moment on the meaning of the cognate term "instruction," in support of the same argument, and also to show that a real and judicious teaching of science, not a random gathering together of scraps of "useful knowledge," does indeed involve a genuine discipline of the mind. The original meaning of *instruere* is to heap up, or pile up, or put together in a heap generally, and seems somewhat to countenance the Chrestomathic notion; but the secondary meaning, and that with which we are more concerned, is "to put together in order, to build or construct;" so that instruction is the orderly arrangement and disposition of knowledge, a branch of mental discipline which all must acknowledge to be of great importance and value. But heaping bricks together, and building a house with them, are two very different things. The orderly arrangement of facts in the mind implies a knowledge of their relation to each other; and, if carried out to a certain extent, furnishes the ground-work for the establishment of those general laws which constitute what is properly called science. The knowledge, however, of these mutual relations is gained by quiet, earnest brooding over facts, viewing them in every kind of light, comparing them carefully together for the detection of resemblances and differences, classifying them, experimenting upon them, and so on. Allowing, then, to science, properly so called, all that can be claimed for it as a constituent of the curriculum—and of its immense value in education I shall have to speak presently—we must explode, definitely and finally, the notion that these valuable results can be elicited by frittering away the powers of the mind on a great variety of subjects. Nor must we be led away by the frequently meaningless clamour for "useful knowledge." Knowledge which may be unquestionably useful to some persons may not be useful at all to others; therefore, although education is to be a preparation for after life, yet it is to be a general, not a professional, preparation, and cannot provide for minute and special contingencies. The object of education is to form the man, not the baker—the man, not the lawyer—the man, not the civil engineer.

What then, we may now inquire, should be the main features of a *training*, as distinguished from an *accumulating*, system of instruction? It should, I conceive, aim at quickening and strengthening the powers of observation and memory, and forming habits of careful and persevering attention; it should habituate the pupil to distinguish points of difference and recognise those of resemblance, to analyse and investigate, to arrange and classify. It should awaken and invigorate the understanding, mature the reason, chasten while it kindles the imagination, exercise the judgment, and refine the taste. It should cultivate habits of order and precision, and of spontaneous, independent, and long-continued application. It should, in short, be a species of mental gymnastics, fitted to draw forth, exercise, invigorate, and mature all the faculties, so as to exhibit them in that harmonious combination which is at once the index and the result of manly growth. In order to gain the ends I have specified, or indeed any considerable number of them, it is essential that the studies embraced in the training course should be few. We cannot hope to have, in the early stage of life, both *quantity* and *quality*. In giving a preference to the latter, we do but consult the exigencies of the case. At the same time, it may be hoped that, because the aim is to enrich and prepare the soil, the ultimate harvest will be proportionately bountiful.*

I have said that the subjects to be studied in the training course should be few. But I proceed further, and maintain that for the purpose of real discipline it is advisable—nay, even necessary—to concentrate the energies for a long period together on some one general subject, and make that for a time the leading feature, the central study of the course—keeping others in subordination to it. By giving this degree of prominence to some particular branch of instruction, we may hope to have it studied to such an extent, so closely, so accurately, so soundly, so completely, that it may become a real possession to the pupil—a source of vital power, which the mind "will not willingly let die." The concentration of mind and range of research necessary for this purpose obviously involve many of the advantages I have recently enumerated. In this way, too, the pupil will become fully conscious of the difference between *knowing a thing* and *knowing something about it*, and will be forcibly impressed with the superiority of the former kind of knowledge. This conviction is of no small importance; for it gives him a clear, experimental appreciation of the agency—the measure and kind of intellectual effort—by which the complete and accurate knowledge was gained, and thus can hardly fail to exercise a valuable influence upon his character. He who has learned by experience the difficulty of obtaining a thorough mastery of a subject has made no trifling advance in the knowledge of himself. He has tested his power of struggling with difficulties, and acquired in the contest that command over his faculties, and that habit of sustained and vigorous application, which will ensure success in any undertaking. He who has only begun a study, or advanced but little in it, is a stranger to that consciousness of strength and range of mental vision which are involved in the cultivation of it to a high point. The knowledge, thus thoroughly acquired and possessed as a familiar instrument by the pupil, becomes not only a powerful auxiliary to his further attainments, but a high standard to which he may continually refer them.*

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* The opinion of Locke confirms this view. His words are: "The business of education is not, as I think, to perfect the learner in any of the sciences, but to give his mind that freedom and disposition, and those habits which may enable him to attain every part of knowledge himself." (*Some Thoughts concerning Education.*)

One of the chief reasons why the study of one thing, one subject, or one book, is so valuable a discipline, is that the matter thus submitted to the mind's action forms a whole, and by degrees reacts on the mind itself, and creates within it the idea of unity and harmony. Suppose, for instance, that we read a book with the view of thoroughly studying and mastering it. We find, as a consequence of the unity of thought and expression pervading it, that one part explains another, that what is hinted at in one page is amplified in the next, that the matter of the first few sentences is the nucleus (the oak in the acorn, as it were) of the entire work. Thus the beginning of the book throws light upon the end, which the end in its turn reflects upon the beginning. He who studies in this way must carefully weigh each word, and estimate its value in the sentence of which it is a part, and its bearing on those which have preceded it; he must also keep it in recollection, that he may observe its connection with what follows. When he encounters difficulties which he cannot at the moment solve, he must retain them in mind until the clue to their solution is gained. He must often retrace his steps with the experience he has acquired in advancing, and then advance again with the added knowledge gained in his retrogression. It is only by thus wrestling—agonising, as it were—with a subject, that we eventually subdue it, and make it ours, and a part of us. By such or analogous processes, constantly and patiently pursued, we rise at last to the highest generalisations; so that a knowledge of the phenomena of the material world is digested into Science, a knowledge of the facts and matter of language is elaborated into Learning, and a knowledge and intimate appreciation of the facts of human life ripens into Wisdom. Every one will bear me out in the remark, that it is from those few books that we read most carefully—that we "chew and digest," to use Bacon's words—that we pursue again and again with still increasing interest—that we take to our bosom as friends and counsellers; it is from these that we are conscious of deriving real nourishment for the mind. Nor is it perhaps rash to assert that the general tendency, in our day, to dissipate the attention on all sorts of books, on all sorts of subjects, which just flash before the mind, excite it for a moment, leave a vague impression, and are gone, is stamping a character upon the age which will render nugatory the well-meant efforts which have of late been made for the enlightenment of the popular mind and the extension of useful knowledge. It is, I say, characteristic of the age that we emasculate and enfeeble our powers by the vain attempt *to know everything which everybody else knows;* and learn, in conformity to the fashion of the times, even to feel it as a reproach that we have not "dipped into," or "skimmed over," or "glanced at" (very significant phrases) all the articles in all the newspapers, magazines, and reviews of the day. We indolently allow ourselves to be carried on in spite of our silent protest, against our real convictions, with the shallow tide which is sweeping over the land; and, inasmuch as we do so, are neutralising the real interests of the cause we profess to be advocating, and preventing the formation of valuable and useful judgments on any subject whatever. If you consider with me that this general dissipation is an evil, you will also sympathise with the desire to prevent the organisation and establishment of the principle in the curriculum of elementary education. A thousand times better, in my opinion, to have the old hum-drum monotony, the ceaseless drill, which ended *only* in preparing the faculties to work to some purpose, when they did work, on the problems of life, than the counterfeit knowledge which can give an opinion on every subject because substantially uninformed on any.

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* The above argument is powerfully confirmed in the following passage from an "Introductory Lecture" by Professor De Morgan, delivered at University College, October 17, 1837:—

"When the student has occupied his time in learning a moderate portion of many different things, what has he acquired—extensive knowledge or useful habits? Even if he can be said to have varied learning, it will not long be true of him, for nothing flies so quickly as half-digested knowledge; and when this is gone, there remains but a slender portion of useful power. A small quantity of learning quickly evaporates from a mind which never held any learning, except in small quantities; and the intellectual philosopher can perhaps explain the following phenomenon:—that men who have given deep attention to one or more liberal studies, can learn to the end of their lives, and are able to retain and apply very small quantities of other kinds of knowledge; while those who have never learnt much of any one thing seldom acquire new knowledge after they attain to years of maturity, and frequently lose the greater part of that which they once possessed." (p. 12.)

It is not, perhaps, too much to assert, that concentration of mind on a few subjects is, and ever has been, the only passport to excellence. All the great literary and scientific men of all ages, whose opinions we value, whose judgments are received as the dictates of wisdom and authority, have acted on the conviction, that the powers of the mind are strengthened by concentration, and weakened by dissipation.*

The practical inference from the foregoing remarks is, that in order to train the mind usefully, concentration, and not accumulation, must be our guiding principle; in other words, we must direct the most strenuous efforts of our pupils to the complete and full comprehension of some one subject as an instrument of intellectual discipline.

The next consideration, then, is, what the subject submitted to this accurate and complete study ought to be. And here we come again nearly to the point at which we set out, and must now for ourselves renew the friendly strife between the "trivials" and the "quadrivials" once more. I say "friendly," because the claims of both are so reasonable that it really ought not to be very difficult to adjust them, and no angry feeling, therefore, ought to accompany the discussion. We have left the theorists behind, and are now to settle such questions as practical and experienced men, with reference to their real merits, judicially, and with some degree of authority.

On the general subject of the curriculum, I will quote some remarks which I have lately met with in a pamphlet by an able American writer, apparently acquainted by experience with his subject.† He is strongly opposed to what we usually call the

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* See some very interesting illustrations in D'Israeli's "Curiosities of Literature," in the essay entitled, "The Man of One Book." To these may be added, as an instructive, though somewhat extravagant, specimen of the *non-multa-sed-multum* principle advocated in the text, the following, taken from the "Foreign Quarterly Review" for 1841:—

"Porpora, an Italian teacher of music, having conceived an affection for one of his pupils, asked him if he had courage to pursue indefatigably a course which he would point out, however tiresome it might appear. Upon receiving an answer in the affirmative, he noted upon a page of ruled paper, the diatonic and chromatic scales, ascending and descending with leaps of a third, fourth, &c., to acquire the intervals promptly; with shakes, turns, apoggiature, and various passages of vocalisation. This leaf employed master and pupil for a year; the following year was bestowed upon it; the third year there was no talk of changing it; the pupil began to murmur, but was reminded of his promise. A fourth year elapsed, then a fifth, and every day came the eternal leaf. At the sixth it was not done with, but lessons of articulation, pronunciation, and declamation were added to the practice. At the end of this year, however, the scholar, who still imagined that he was but at the elements, was much surprised when his master exclaimed, 'Go, my son; thou hast nothing more to learn; thou art the first singer of Italy, and of the world.' He said true. This singer was Caffarelli."

† "Classical and Scientific Studies, and the Great Schools of England." By W. P. Atkinson. Cambridge (U.S.), 1865.

Classical System, but candidly admits that its defenders have hitherto had greatly the advantage of their opponents in the line of argument they have pursued. "Disagree with them," he says, "as you may as to what studies go to make up a liberal education, you must go to them for a true definition of that training of mind in which a liberal education consists." As he is one of the ablest advocates of the claims of Science, we may listen to what he says on its behalf as a part of school education. He assumes, then, as axioms these following propositions:—

"1. That in the Science and Art of education we must study and follow Nature,—that we shall only be successful as far as we do.

"2. That there is a certain natural order in the development of the human faculties; and that a true system of education will follow, not run counter to, that order.

"3. That we may divide the faculties of the mind, for the purposes of education, into observing and reflective; and that in the order of development the observing faculties come first.

"4. That individual minds come into the world with individual characteristics; often, in the case of superior minds, strongly marked, and qualifying them for the more successful pursuit of some one career, than of any other.

"5. That the study of the material world may be said to be the divinely appointed instrument for the cultivation and development of the observing faculties; while the study of the immaterial mind, with all that belongs to it, including the study of language as the instrument of thought, is the chief agent in the development of the reflective faculties."

Speaking in the interests of that reform in the curriculum, which is very decidedly needed, I would frankly accept these propositions, though the terms of some of them, especially those of the fourth and fifth, might give the caviller a favourable opportunity. Of one point essentially involved in them I have no doubt; and that is, that any rational curriculum of elementary study must be based on the fact that the observing are called into action before the reflecting faculties; in other words, that the food must be swallowed before it is digested; though I believe it to be an educational fallacy to maintain that therefore no food should be swallowed that cannot be instantly digested. The general consideration would, however, seem to justify us in carrying forward, before anything else is attempted, the instruction which the child has already commenced for himself, in the study of the phenomena of the external world, and in that of the mother tongue. Professor Tyndall has shown, in his interesting lecture on the study of Physics, that even the new-born babe is an experimental philosopher, and improvises by instinct a suction-pump to supply himself with his natural food, and day after day, by experiment and observation, makes himself acquainted with the ordinary properties of matter, acquires the idea of distance, sound, and gravitation, and so on, and by burning his fingers and scalding his tongue, learns also the conditions of his physical well-being. In this hand-to-mouth way the pupil in the great school of Nature begins his lessons, and surely it is most natural that he should be encouraged to continue this self-education, and, under judicious guidance, he may very properly be made acquainted with the things "which lie about in daily life," and also be trained to the study of that proper connection between things and words which is the true basis of a good knowledge of his own language. Such a course of instruction, such "lessons on objects," will no doubt amuse and interest the young natural philosopher, and may be the means of eliciting, even quite early in life, those predilections of which Mr. Atkinson speaks as the special characteristics of the individual, and which, in certain cases, may furnish suggestions to be afterwards employed in conducting his education.

Having arrived at this point in the discussion of my subject, I must make a confession;—which, however, is not humiliating, because, though I have to speak of personal failure, I am supported by the consciousness of honest intentions. I have always been fond of science in every shape, and well remember the delight with which, when a boy, I adopted as the pocket companions of my leisure hours the little volumes of Joyce's "Scientific Dialogues," and Miss Edgeworth's charming "Harry and Lucy." I say this to show that in the experiments which I made in teaching something that might be called science to young children, I was working *con amore*, and with a real desire to succeed. But I found my young natural philosophers somewhat difficult to manage. As long as everything was new, and striking, and amusing, they were attentive enough; but as soon as anything like training was attempted, as soon as I required perfect accuracy in observing, and careful classification and retention of results, my popularity waned astonishingly. They were, for the most part, satisfied with the attainments which they had made in the knowledge of the external world within the first three or four years of their lives, and did not discover that "craving after knowledge" which, I am told by

Mr. Spencer and others, is always exhibited by children until it is for ever extinguished by the spectral display of the Latin grammar, which, like the famous Medusa's head, turns every one that looks at it into stone. According to my own experience, the young natural philosophers generally preferred choosing their own subject of instruction, and their own arena for the exercise; and that subject was what is usually called play, and the arena the playground. It is true enough that there is a great deal to be learned of the properties of matter,—resistance, elasticity, action and reaction, the composition of forces, &c.,—in playing at bat, trap, and ball;* but I doubt very much whether there is any natural craving after such knowledge as the final cause of the game.

In general, I must say from experience that it is as possible to make even abstract subjects, such as arithmetic and grammar, quite as interesting to young children as those parts of science which really call for mental effort, and involve minute accuracy and care. Facts and phenomena certainly do interest the young; but science, as such, the knowledge of the relations between them, does not. Practical teachers are well aware of this fact, which theoretical writers too often forget, or, most probably, do not know.

Because children attending a lecture on natural Science open their eyes very wide, and look intensely interested when they hear a loud bang, or see some of those striking experiments performed—often in a sort of *à la* Stodare fashion—which form the stock-in-trade of the lecturer on, say, oxygen and hydrogen gases, it is too hastily concluded that that would be the normal condition of their attention to the science of chemistry in general. Look, however, at the same children when the lecturer takes his chalk in hand, and endeavours, by a diagram of very simple character, to make them understand the causes of the phenomena. The lack-lustre eyes and the yawning mouth very soon tell us that what we just witnessed was simple excitement, a matter of the senses, nerves, and muscles mainly, and being connected with amusement, and therefore involving no mental exertion, caught the attention for an instant, but was not in itself an element of mental improvement. The moment the *mind* was called on, it obeyed the summons with just as much alacrity as it usually displays when invited to dissect a diagram of Euclid. The assertion that, as a general rule (and independently of the all important question of what sort of a man the teacher is), children love science and hate language, is another fallacy of the same kind as those we have been already so liberally dealing with this evening. Neither children nor men naturally like the difficulties, the drudgery, of any subject whatever. No practical teacher will pretend that they do. Yet these difficulties must be overcome, if the subject is to be really learned. But we may test my position by reference to music. I might, of course, indulge in any amount of rhapsody about music,—its exquisite charms, its universal popularity, and so on,—but what verdict would a jury of little girls give on what is technically termed "practice," and on the "grammar of music?" That "practice," however, and that "grammar," are the very foundation of the excellent performance which so delights our ears and our taste, and without the one we absolutely cannot have the other. I wonder, indeed, whether, if we could collect all the tears which have been shed by children respectively learning the Latin grammar and the piano in two separate receptacles, the music lachrymatory would not contain the larger quantity. And yet music is so delightful, and the Latin grammar so horridly disagreeable! To return, however, to my main argument.

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* This is very pleasantly exemplified in Dr. Paris's ingenious little book, "Philosophy in Sport made Science in Earnest."

The early stage of life is doubtless the most suitable time for improving and exercising the natural faculty of observation, and much may be done at this time in preparing the mind for the great benefit which the proper study of science is to confer upon it. But I must protest against dignifying the desultory scraps of information thus acquired—the results of the process of taking up one subject after another to keep the child in good humour—the cakes and honey supplied to sweeten the youthful lips—by the name of science; nor do I feel inclined to think that we have at last reached the long-sought desideratum in teaching, when a band of children, in all the frolic and fun belonging to their nature, gather handfuls of flowers, and run up to the teacher to ask the names of them, and—to forget them as soon as named.* However, if this is science, I would certainly teach it in the early stage of instruction. Children generally like this desultory style of skipping from subject to subject. It stimulates their senses, brings them into contact with Nature herself in the open air, interests them in her glorious variety and boundless fulness, and thus supplies happy emotions; it calls for little exertion on their part, does not "bother their brains," and is rarely the occasion of tears or punishments.* If this is science, I would teach it as a part of the training of the observing faculties, a discipline which has been too much neglected by the ordinary systems; † and in the hands of a judicious teacher, out of these random efforts real instruction may grow; and the bricks thrown together in a heap, and so far valueless, may, under the genial influence of the educational Amphion, rise up, like the walls of the fabulous Thebes, into the form of a harmonious fabric.

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* Mr. Henslow's interesting experiments in teaching village children accomplished much more than this; and, indeed, proved the applicability of the subject to the wants of the early stage of education. (See "Museum," vol. iii, p. 4, and "Educational Times," Nov., 1865.)

We must not, however, forget that our young philosopher, who has learnt so much by himself in the first two or three years of his life by exercising his faculty of observation, also develops, in the some space of time, eminent powers as a linguist; and if we follow Nature in aiding and encouraging his researches in the one field, it appears quite right to do the same in the other. Indeed, the two faculties are exactly adapted to assist each other; for, notwithstanding all that is said about the learning of things as opposed to the learning of words, there is a sense in which they are one and the same, and it is very curious to see how Mr. Spencer, for instance, in describing what he evidently considers model lessons in elementary science, speaks as if a great part of the object of these lessons was to teach the accurate meaning of words. "The mother," he says, "must familiarise her little boy with the *names* of the simpler attributes, hardness, softness, colour; in doing which she finds him eagerly help by bringing this to show that it is red, and the other to make her feel that it is hard, as fast as *she gives him words* for these properties." There is much more to the same purport, which I have no time to quote. But is it not singular that so ingenious a man does not see that this process, which he lauds so highly, is only a sensible way of teaching, not *science* merely, but the *mother tongue?* The teacher is trying to get the pupil to attach clear ideas to the use of words; and, while professing to despise the teaching of words, is in reality doing little else; for words are, in a well understood sense, the depositories of the knowledge, spirit, and wisdom of a nation.* I am perfectly aware that the pupil, while thus engaged, is learning much more than mere words; but I maintain that he is also learning words while he is learning things, and that the antithesis so much insisted on is more specious than real. However this may be, I quite approve of these lessons on things, or lessons on words, whichever they may be called, as a part of the elementary stage of instruction, which may be practically considered as terminating *at twelve years of age.*

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* It is well, too, to encourage children to make collections of leaves, butterflies, beetles, &c. Everything should be done to make the connection between teacher and pupils pleasant for both; and therefore sympathy should be warmly evinced in such pursuits as these. Professor Blackie has well expressed these views in the following passage from a lecture delivered in Latin, at the Marischal College, Aberdeen:—"Exeant in campos pueri, fluminum cursus vestigent, in montes adscendant; saxa, lapides, arbores, herbas, flores notent, et notando amare discant; oculis non vagis, fluitantibus et somniculosis, sed apertis, claris, firmis; auribus non obtusis insertisque sed erectis atque accuratis rerum varietatem percipiant. (*De Latinarum literarum præstantia atque utilitate*, p. 13.)

† See Appendix, Note B.

But this stage is also the most suitable for learning the use of a foreign tongue, and, therefore, to the elementary subjects which must, as a matter of course, come into the curriculum—reading, writing, arithmetic, taught at first by palpable objects, or counters; geography, commencing with the topography of the house and parish in which the pupil lives; history, made picturesque by oral teaching in such a way as to arrest the attention and stimulate the imagination; lessons on objects as introductory to the rudiments of science; word-lessons,† gradually extended from the names of material objects to those of moral and intellectual notions—should be added the study of French. The lessons in this language should be eminently practical; accurate pronunciation should be insisted on, and as rapidly as possible the actual practice secured. This is the main point. At no period of life will so good an opportunity be found for doing this in an easy, natural way. The organs are in a flexible condition, the ear is apt at catching, the mouth at imitating, sounds; and without even talking of grammar (should such talk seem very alarming) a true initiation into the language may be gained. All that has now been suggested appears to be quite consistent with the principle above recommended, of continuing the exercise of the faculties of observation and imitation already commenced by Nature.

Such rudimentary lessons in science as have been proposed above do not appear to involve much strict mental discipline; nor do I believe, for reasons which will presently be suggested, that true science can advantageously be studied by very young pupils.‡

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* He who completely *knows* a word knows all that that word is or ever was intended to convey, its etymological origin, its first meaning as fixed in the language, its subsequent history, its varying fortunes, and the idea it suggests to various classes of persons.

† Hints for such lessons might be gained from Wood's "Account of the Edinburgh Sessional School;" but better ones can easily be framed.

‡ It is only fair to place in view here the opinions on this point of Dr. Carpenter and Mr. Faraday, to whose judgment on any subject great deference is

There is, however, one subject which might, perhaps, be taken as the disciplinary study of the elementary stage, and with the greatest advantage. That subject is Arithmetic, which, if judiciously taught, involves a genuine mental discipline of the most valuable kind; and though really abstract in its nature, is capable of exciting the liveliest interest, while it forms in the pupil habits of mental attention, argumentative sequence, absolute accuracy, and satisfaction in truth as a result, that do not seem to spring equally from the study of any other subject suitable to this elementary stage of instruction.

At twelve years of age the pupil may be considered as entering on the second stage of the curriculum; and henceforth the development of the reflective faculties, and the acquisition of habits of industry and hard work, are the main objects to be kept in view. This is to be especially the stage of discipline; discipline by means of Science (including Mathematics) and Language. The question now is, which shall take the lead.

Science may, for our present purpose, be defined to be *the knowledge of the laws of Nature, as gained by reflection on facts which have been previously arranged in an orderly and methodical manner in the mind in accordance with their natural relation to each other.* Every one must see that such a subject as this affords abundant scope for a life-long, and not merely a school, education. Considering, too, that this knowledge is not only deeply interesting in itself, but, being gained for the very purpose of diffusion, adds greatly to the sum of human happiness and prosperity, the motives to its pursuit are indeed transcendently powerful, so that it must be a matter of great concern to all to secure for those who are to pursue it, even in a subordinate degree, a worthy training.

due; only adding, that I should attach more value to their opinions on teaching men, to which they are accustomed, than on teaching children to which, as far as I know, they are not accustomed. In this matter, as in others referred to before (see p. 13), going through with a thing is very different from merely beginning it, or touching it at special selected points. Have these gentlemen taught children hour after hour, year after year?

"At ten years old a boy [and therefore the average of boys] is quite capable of understanding a very large proportion of what is set down for matriculation at the London University under the head of Natural Philosophy." (*Dr. Carpenter's Evidence before Commission on Public Schools*, vol. iv, p. 364.)

"I would teach a little boy of eleven years of age [*i.e.*, the average boys of eleven?] of ordinary intelligence, all these things that come before classics in this programme of the London University, *i.e.*, mechanics, hydrostatics, hydraulics, optics," &c. (*Mr. Faraday's Evidence*, vol, iv, p. 378.)

If science, then, is to constitute a real discipline for the mind, much, nay everything, will depend on the manner in which it is studied. In the first place, it is to be remembered that (to use the oft-quoted phrase) the pupil is about to study things, not words; and therefore treatises on science are not to be in the first instance placed before him. He must commence with the accurate examination (for which he has been partially prepared by the first stage of instruction) of the objects and phenomena themselves, not of descriptions of them prepared by others. By this means not only will his attention be excited, the power of observation, previously awakened, much strengthened, and the senses exercised and disciplined, but the very important habit of doing homage to the authority of facts, rather than to the authority of men, be initiated. These different objects and phenomena may be placed and viewed together, and thus the mental faculties of comparison and discrimination usefully practised. They may, in the next place, be methodically arranged and classified, and thus the mind may become accustomed to an orderly arrangement of its knowledge. Then the accidental may be distinguished from the essential, the common from the special, and so the habit of generalization may be acquired; and lastly, advancing from effects to causes, or conversely from principles to their necessary conclusions, the pupil becomes acquainted with induction and deduction—processes of the highest value and importance. Every one will allow that such a course as this, faithfully carried out, must prove to be a very valuable training. It would not, indeed, discipline the mind so closely as pure mathematics, yet its range is wider, and it is more closely connected with human interests and feelings. It is no small advantage, too, that it affords, both in its pursuit and its results,—both in the chase and the capture,—a very large amount of legitimate and generous mental pleasure, and of a kind which the pupil will probably be desirous of renewing for himself after he has left school. After all, however, it will be observed that, while the study of the physical sciences tends to give power over the material forces of the universe, it leaves untouched the greater forces of the human heart; it makes a botanist, a geologist, an electrician, an architect, an engineer, but it does not make a man. The hopes, the fears, the hatreds and the loves, the emotions which stir us to heroic action, the reverence which bows in the presence of the inexpressibly good and great; the sensitive moral taste which shrinks from vice and approves virtue; the sensitive mental taste, which appreciates the sublime and beautiful in art, and sheds delicious tears over the immortal works of genius—all this wonderful world of sensation and emotion lies outside that world which is especially cultivated by the physical sciences. This is no argument, of course, against their forming a proper, nay an essential, part of the curriculum, but it is an argument against their taking the first place. They are intimately connected, of course, with our daily wants and conveniences. The study of them cultivates in the best way the faculties of observation, and leads naturally to the formation in the mind of the idea of natural law, and so ultimately to investigations and suggestions of a very high order, in the pursuit of which it is sought to define the shadowy boundary between mind and matter, or to reveal to present time the long buried secrets of the past. But in order to attain at last these eminent heights of science, the preliminary training must be rigorous and exact. It must embrace the difficult as well as the pleasing and amusing—that which requires close and long-continued attention as well as that which only ministers to a transient curiosity. It must be based on the "firm ground of experiment," and be independent of mere book study, which, it has been well observed, is, in relation to science, *only as* valuable, in the absence of the facts, as a commentary on the Iliad would be to him who had never read the poem.

We may assent then, on the whole, without hesitation, to the wise and careful judgment passed on the study of physical science as a part of the Curriculum by the Public School Commissioners in their report. "It quickens," they say, "and cultivates directly, the faculty of observation, which in very many persons lies almost dormant through life, the power of accurate and rapid generalisation, and the mental habit of method and arrangement; it accustoms young persons to trace the sequence of cause and effect; it familiarizes them with a kind of reasoning which interests them, and which they can promptly comprehend; and it is, perhaps, the best corrective for that indolence which is the vice of half-awakened minds, and which shrinks from any exertion that is not, like an effort of memory, merely mechanical." In spite, then, of Dr. Moberly's denunciation of such studies as "worthless," and as "giving no power" in education,* I maintain that it is utterly impossible to exclude a subject with pretensions like these from our curriculum. They must and will occupy a considerable space in it—they deserve to do so. For reasons, however, already stated, I would not give them the post of the highest distinction, which ought to be reserved for the studies which exercise, not special faculties, but the whole man; not the man as a professional and with a utilitarian end in view, but as a citizen of the world, as one who is to meet his fellow-men and to influence their decisions upon the difficult and complicated problems of society.*

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* "In a School like this (Winchester), I consider instruction in physical science, in the way in which we can give it, is worthless. . . . A scientific fact . . . is a fact which produces nothing in a boy's mind. . . . It leads to nothing. It does not germinate; it is a perfectly unfruitful fact. . . . These things give

Some think that pure mathematics should occupy this central post of honour. A moment's consideration, however, will show that the study of algebra, geometry, the calculus, &c., not only does not embrace those topics of common interest which are essential for our purpose; but has a special and limited office to perform—I mean, of course, independently of their practical applications. Lord Bacon has judiciously summed up their special functions. "They do," he says, "remedy and cure many defects in the wit and faculties intellectual; for if the wit be too dull, they sharpen it; if too wandering, they fix it; if too inherent in the sense, they abstract it. So that, as tennis is a game of no use of itself, but of great use in respect it maketh a quick eye, and a body ready to put itself into all postures; so with mathematics, that use which is collateral and intervenient is no less worthy than that which is principal and intended." These words aptly characterise the advantages of the study of mathematics, and point out their proper office in education. They cannot, from their very nature, exercise a formative power over the whole mind; but they are very profitably employed in correcting certain defects, and in teaching, as scarcely anything else can teach, habits of accuracy. They call into play but few of the faculties; but these they exercise rigorously, and therefore usefully. It has been objected to them, that when pursued to any considerable extent, without the counterpoise of more general studies, they become particularly exclusive and mechanical in their influence; but this perhaps can hardly be considered as an essential characteristic. On the whole, however, it can scarcely be maintained that mathematics will serve as the basis we require for our educational operations, though no education can be considered as complete which excludes them.

Having then shown that, notwithstanding the great value both

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no power whatever." (*Evidence before Commission on Public Schools*, vol. iii, p. 334.)

* See Dr. Johnson's opinion, Appendix C.

of physics and of mathematics in education, they are too special in their application to serve as the central subject in our curriculum, we turn once more to language, and especially to the Latin language, which I should propose as the exercising ground best adapted for the intellectual drilling of our young soldier. Greek, in the case of those whose school education is to terminate at sixteen years of age, must, I think, be displaced in favour of the practical claims of German. This concession, and this only, would I recommend making to public opinion. And it is the less necessary to contest this point, as nearly all the disciplinary advantages which so eminently characterise the study of the classical languages may be gained from the study of Latin alone. It may then, I conceive, be fairly maintained, that the place which classical instruction holds in the curriculum of English education is not due to prejudice, as some believe; nor to ignorance of what is going on in society around us, as others pretend; but to a well-judged estimate of its importance and value as a discipline for the youthful mind, and as an element of the highest rank among the civilizing influences of the world.

This study may be considered under two aspects, the language itself and its literature.

My first proposition is that the study of the Latin language itself does eminently discipline the faculties, and secure, to a greater degree than that of the other subjects we have discussed, the formation and growth of those mental qualities which are the best preparatives for the business of life—whether that business is to consist in making fresh mental acquisitions, or in directing the powers, thus strengthened and matured, to professional or other pursuits.

Written language consists of sentences, and sentences of words. In commencing the study of a language, we may consider these words as things, which we have to investigate and analyse. They possess many qualities in common with natural objects, and may be therefore treated in a somewhat similar way. They have material qualities; they can be seen—they can be named (their sound is their name)—they can be compared together—their resemblances and differences discriminated, and arrangements or classifications of them made in accordance with observed similarity or difference in form. The memory, too, is practically and systematically exercised. The paradigms of inflexions must be accurately learnt by heart, and so familiarly known that the constant comparison between them as standards, and the varying forms which arise for interpretation, may be spontaneous and easy. And these acts of comparison are themselves of great value, and tend to cultivate accuracy of judgment: the very blunders made are instructive: the half-perception induced by indolence must be corrected by increased labour. The attempt at evasion ends in a more complete reception; hence a moral as well as a mental lesson. Thus, acts of attention, observation, memory, and judgment are called forth; and these acts, by being performed numberless times, grow into habits. Again, these words can be analysed, separated into their component parts, and these parts severally examined, and their functions ascertained. Conversely, we may employ the synthetic process. We may fashion these elements in conformity with some given model, and thus adapt them to some given end. By closer investigation and comparison, affinities before unperceived are traced and appreciated, the transformation of letters detected, and the foundation laid for the science of Philology. It should be observed that all these operations or experiments (for so they may be called) are performed on facts—on objects (a word is as much an object as a flower) directly exposed to observation; that they are at the same time simple in their nature, and though requiring minute attention, and so forming the habit of accuracy, are evidently within the competency of a child. It is no small advantage that the means of training the mind to such habits are always within reach, and available to an unlimited extent; and not, as is often the case with respect to physical objects, adapted to elicit somewhat similar exertions, obtained with difficulty, and therefore, perhaps, only heard of, and not seen.

But the attention of the pupil, at times necessarily occupied with the accidents or inflexions—the characteristic point of difference between his own and the Latin language—is at others directed especially to what we may call the *being* of each word, the idea which it is intended to convey or suggest. And now these words, lately treated as simply material, inanimate and dead—anatomical "subjects"—are to be considered as invested with a kind of physiological interest, and as exhibiting phenomena of life whose nature it becomes important to study. Our pupil's interest in them, viewed under this aspect, cannot but be much augmented. Words are now no longer things merely, but significant symbols of ideas. These little organisms, in one sense mere torpid aggregations of matter, are in another, when placed in juxtaposition with words of our language, or when viewed in connection with cognates of their own, capable of affording vivid illustrations of the methods and artifices by which languages are formed. Hence arise exercises in *derivation*, or tracing of words up to their roots, and in *analysis*, or breaking up the compounds into their several components. These exercises in *derivation* cultivate, moreover, when properly carried out, the habit of deducing the secondary and figurative senses of words from the primary and literal. Such an exercise leads the pupil beyond the boundaries of mere language. In pursuing it, he learns to study the mode in which the early stages of society formed their conceptions, and to notice how, as civilization advanced, the language, too, bore evidence of the change. Thus the word *gubernare* primarily means to pilot a vessel; secondarily, to direct the vessel of the state, to *govern.**

But words, in themselves vital organisms, though frequently the life is rather latent than visible, are also to be considered in their combination in sentences. Their vitality now becomes intensified. The original author, speaking to men of his own nation, and aptly employing the resources of his craft, had by a kind of intellectual magnetism converted the neutral and indifferent into the active and significant, and constrained all to co-operate in effecting his great purpose of speaking out to other minds. And there, before the eyes of our pupil, is the result. But it does not speak out to him. That sentence, beginning with a capital and ending with a full stop, is a body with a soul in it, with which he has to communicate. But how to do this? His eye passes over it. It looks unattractive, dark, and cold. Soon, however, something is seen in the words, or their inflexions, which he recognises, by a kind of momentary flash, as significant. The soul within begins to speak to him; and he catches some faint conception of what it would reveal. As he still gives heed, other points show symptoms of life, and the lately brute and torpid mass becomes vocal and articulate. One after another the words kindle into expression; clause after clause is disentangled from its connection with the main body of the sentence, and appreciated both separately and in combination, until at length a thrill of intelligence pervades the whole, and the passage, before dark, inanimate, and unmeaning, becomes instinct with light and life.

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* This sort of investigation often opens a very interesting field of inquiry. Thus the word *virtus*, in different stages of the Roman history, meant successively, active physical courage or manhood, and active moral courage or virtue; while later, in Rome's comparatively degenerate days, *virtu* signified a taste for the fine arts! a pregnant commentary on the character of the people. That people, however, it may be remarked, has already begun to *restore* the original meaning of the word.

By these and similar processes, which it is needless to specify, the pupil learns to apprehend his author's meaning, though perhaps at first only obscurely. The next stage in his training is to find words and phrases in his native tongue suited to express it. To do this adequately, he must not only ascertain the meaning of each term, but conceive fully and correctly all the propositions that constitute a complete sentence, in their natural connection and interdependence; he must observe the bearing of the previous sentences on the one under consideration, and the ultimate point to which all are tending. Now, in order to convey perfectly to others the meaning, which he has himself laboriously acquired, he must not only have made an exact logical analysis of the sentence, so as to see what he has to say, but must exercise his judgment and taste (not to say knowledge) on the choice of words and phrases which will best answer the purpose, and truly represent the clearness, energy, or eloquence of the author. To do this faultlessly requires of course the matured judgment and refined taste of the accomplished scholar; but the very effort involved in the attempt to grasp the spirit of the author, to rise to the elevation of his thoughts, and to gain the sympathy of others for them by an adequate and worthy representation of them in his native language, cannot but elevate his own mental stature. "We strive to ascend, and we ascend in our striving."

The advantages of such a course as I have now sketched must be acknowledged to be very great, although only *the language* is as yet under consideration. But there are two or three other points that must not be omitted. The first of these is the value of the strict grammatical analysis required. The process of eliciting light out of darkness, before described, can only be accomplished by one who is armed with grammatical power. Without this, the efforts made to communicate with the soul of the author must be feeble and ineffectual. It is one of the special objects of the course I am advocating, to cultivate this faculty, because in doing so we are in fact cultivating to a high degree the reasoning powers of the pupil. The construction of words in a sentence does not depend upon arbitrary laws, but upon right reason, upon the exact correspondence between expression and thought, and therefore "good grammar," as has been well observed, "is neither more nor less than good sense."*

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* As the analysis of sentences is now become a regular part of the study of English in all good schools, I would strongly recommend its also being made ancillary in the study of Latin. Lessons on the essential elements of a sentence,

A wise teacher—one who wishes to quicken, and is anxious not to deaden, his pupil's mind—will not, of course, force upon him those indigestible boluses, the technical rules and definitions of syntax, *before* training him to observe the facts on which the rules are founded; but will accustom him to the habit of reasoning only *in the presence of facts*, which is so valuable at all times. The habit of reasoning on the construction, the syntax of one language, is, of course, generally applicable to others; and its practice in connection with Latin tends, by an amount of experience which countervails all theory, to prepare the pupil for learning his own language thoroughly.

In addition to the grammatical advantage just named, there are two others I would mention which prove that learning Latin is a good preparation for the better knowledge of the mother tongue: the one is, that as so large a part of the vocabulary of the English language is derived from the Latin, either directly or indirectly, through the French, no accurate study of the former can be accomplished without a fundamental knowledge of Latin. According to Archbishop Trench, thirty per cent. of the vocabulary actually used by our authors is derived from the Latin; and the proportion is still greater if we analyse the columns of our English dictionary, where the words are what is called "at rest." Indeed, to so great a degree have we admitted these aliens into our language, that we have learnt to attach Latin prefixes and suffixes to pure English roots, so as to form new and hybrid compounds. But further,—and this point is less obvious than that adduced,—as almost all our greatest authors were trained in the classical school, both their vocabulary and phraseology, their language and their thoughts, bear a characteristic stamp upon them which can only be fully appreciated by those who have undergone a similar training. It is not too much to say that many exquisite graces, both of thought and expression, in the words of Bacon, Milton, Sir T. Brown, Jeremy Taylor, Sir W. Temple, Gray, Young, Cowper, and others, must elude the notice—and so far fail in their object—of a reader not qualified to meet the authors as it were on their own ground.*

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on "subject" and "predicate," and on the predicative, attributive, and other relations (such as may be found admirably displayed in Mason's English Grammar), should form the basis of the teaching of Latin, as they do of English, syntax. Their application to Cæsar, Cicero, or Virgil, would be not only most valuable in itself as mental training, but would greatly lessen the difficulties felt by a boy in dealing with complicated constructions which are new to him.

* Examples are numberless: just three or four occur at this moment. Take Milton—

And may I add that, as far as my own observation goes, by far the most enthusiastic lovers of our own language and literature are the votaries of classical learning? They love more because they can appreciate better.

But it will be thought that I have sufficiently pleaded the cause of Latin as far as the language is concerned. I must, therefore, devote a few words to its literature. In a course such as I have proposed, and which I would commence at twelve, with the idea of carrying it on up to the age of sixteen, and employing in it half the hours of every school day, and which would comprehend, besides the study of the language, such cultivation of geography, history, archæology, &c., as would be required for the elucidation of the text, and also the parallel study of English literature, we could not hope to read many authors. Indeed, faithful to the principle, *multum non multa,* I would not even attempt it. A selection of the best might be made, to be studied on the principle that they were to be actually known, not merely "gone through,"* by means of which not only would the pupil profit by the invigorating discipline I have described, but be subjected to the enlarging and refining influence which would place him in communion with some of the master spirits of antiquity, and therefore give him an introduction to those great authors of all modern times whose labours have tended to form the civilisation of Europe. In no other way can he so well be introduced to the commonwealth of letters, and be made free to avail himself of its privileges. The fact that these finished works of literary art still survive amongst us, as real substantial powers whose influence cannot be gainsaid, is a wondrous proof of their merit as models of composition. They present us with

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"Satan exalted sat, by *merit* raised
To that bad eminence."—(*Par. Lost,* ii, 5.)

"The undaunted fiend what this might be *admired;*
Admired, not feared."—(*Par. Lost,* ii, 677.)

"That wise and *civil* Roman, Julius Agricola."—(*Areopagitica.*)

"Sadness does, in some cases, become a Christian, as being an index of a pious mind of compassion, and a wise, proper *resentment* of things."—(*Jeremy Taylor.*)

"*Prevent* us, O Lord, with thy most gracious favour."—(*Book of Common Prayer.*)

"This proud man *affects* imperial sway."—(*Dryden.*)

It is obvious that a mere English scholar, uneducated in classics, would not of himself see the exact meaning of the words in italics.

* See Appendix D.

histories which still enlighten and instruct men in the art of government, with oratory which still speaks in trumpet tones to the human heart, with poetry still "musical as is Apollo's lute;" in short, with matter which, however now disparaged, has served in successive ages both to furnish men with thoughts, and to teach them how to think; so that in truth, though styled dead, they are, in the highest sense, ever living; having (to use Hobbes's eloquent expression) "put off flesh and blood, and put on immortality."

But I must pass in review a few of the objections commonly taken against the positions I have maintained in this paper.

1st. Some object to the very principle of a central or fundamental study, and denounce it as a fundamental fallacy. Since it is admitted, they say, that it is not so much the subject as the manner of learning it that constitutes the discipline, one subject is as good as another; and as it is a matter of great importance to interest the pupil, we had better adopt subjects *pro re natâ*, which seem likely to accomplish that object, without respect to their rank in the circle of knowledge. We may thus secure the object in view without the difficulty, perplexity, hard work, and sometimes even tears, which are attendant on a stricter discipline, and which often set the pupil against learning altogether. To refute this objection I should have to repeat much of my previous argument, in which you will remember I contended for the upholding of one subject, or at least very few subjects, on the principle that while, with regard to some, we may be contented with a general knowledge, there should be one at least which should be learned as well as possible and serve as a sort of standard of comparison. I accept, however, these objections as valid, on condition that those who uphold them will promise that their pupils shall not shirk the drudgery, the drill, which must be undergone in the learning of any subject whatever, and which often constitutes the most valuable part of the process; that in teaching music they will strictly require the "practice" and also the "grammar of music;" in teaching languages, perfect grammatical analysis; in teaching science, rigidly close attention to details, however irksome, and to every step of the reasoning properly deduced from them. If the objectors accept this test, they surrender the position that the study is to be accommodated to the pupil, and therefore tacitly allow the principle of a training subject; if they do not, they are driven back upon the Chrestomathic curriculum, and the idea of real education, as I understand the term, is given up.

2nd. It is maintained that if a leading subject is desirable, modern languages, or our own, would more usefully occupy that position.

First, with regard to the modern languages. Their eminent claims to a high place in our curriculum are at once admitted. They have a great practical value as languages; and their literatures are brilliant and attractive, and fraught with modern interest. Both French and German, too, have affinities with English, the one as being a daughter of that paternal stock from which we derive so much, and the other as belonging to the great Teutonic family of languages, of which ours is also a member. Then, in consequence of the increasing intercourse between nations, they are becoming every day more and more useful; and lastly, involving as they do many of the advantages claimed for Latin, they are much more easily and rapidly acquired. These are valid reasons for admission into the curriculum, but not for taking the leading place in it. As to French, so many of its words resemble our own, and its construction is apparently so simple and transparent, that a pupil is tempted to guess or scramble at the meaning, rather than carefully approach it by thoughtful consideration, as he must do in Latin. Without dwelling on this as an evil in itself, I must insist on it as a great disadvantage in a training subject. A certain amount of resistance, enough to encourage effort, and not enough to intimidate, is an advantage rather than otherwise to the pupil. It serves to detain him awhile in face of the difficulty, and gives him the opportunity of estimating both it and the resources with which past experience has furnished him for its solution, and thus trains the mind to encounter successfully other difficulties. On the other hand, as we avowedly learn French and German more for practical than literary purposes, more as means than ends, the less resistance we meet with, the more rapid the acquisition, the better. The training subject is, however, in a certain sense, the end itself; and losing time in acquiring it may be an ultimate gain. The same general remarks apply, though less strictly, to German, which I have recommended as a substitute for Greek.

Secondly, as to the claims of English to occupy the leading place. The main objection to this claim, as far as the language itself is concerned, is that we are, as is sometimes said of a material object, too near to see it. We must stand at some distance from it, in order to comprehend its form and features, or, which is often easier, study the form and features of something else of the same kind, and then apply the knowledge thus gained to the case in point. Those who ask us to study the general principles of grammar, by the acknowledgment of all so valuable, in our own language first, pretend that they are substituting the easy for the difficult; but it is not so. The real difficulty is to abstract the clear and transparent medium in which our ideas circulate, and to view it by itself. So with the study of human nature; obvious as it seems to look at home, to know ourselves, to watch the operations of our own hearts and minds, yet general experience admits that it is far easier to gather its principles from observing the actions of other men projected, as it were, before our view, and favourably adapted for our examination. Our own language, then, is to be the object, rather than the means, of our pupil's training. Throughout his entire course his training in another language is preparing him most effectually to learn his own, and the practical application of the disciplinary power should keep pace with its attainment.

Another objection against the spirit of the method I would recommend has been taken, and may be deserving of a brief treatment. It is said that much of what I have described is simply "drill," and that it is absurd to expend a great amount of labour on mental gymnastics, merely for the sake of the discipline, while, by taking up a more suitable subject, we may get both discipline and knowledge together. Why, says the objector, make a postman, who has to walk about all day, go through a preliminary drill every morning, since he gets his exercise in his work?* And the argument seems to be, that exercise for the direct purpose of developing power, which may be developed by ordinary action, is undesirable. Without attempting a full reply to this objection, I would however suggest, in the first place, that, if logically carried out, it would abolish education altogether. If the ordinary spontaneous action is sufficient, teaching is tyranny, for it implies that the pupil must be constrained. Why not allow the child to wander about and play from morning to night, "at his own sweet will?" His senses and his thoughts will be employed in some way or another, and practice will make perfect. No teacher, however, adopts such principles as these, nor are they worthy of serious refutation. Secondly, I would remark that the practice of all professed trainers, whether of men or animals, refutes the objection. In order to make a soldier, it is generally thought well to keep him on the parade-ground a long time, doing goose or other steps, which he is not to use at all after the training is over. So it is with music, dancing, riding, rowing, and other accomplishments, in which the training exercises are the essence of the teaching.

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* See Atkinson's pamphlet, before quoted, p. 33.

The teachers of these arts consider *practice* so valuable, so indispensable, as a means to the end they have in view, the attainment of complete command over them, that they recommend constant repetition of the same exercise until it is thoroughly mastered; rather than rapid advancement to the next stage of knowledge; so that for a while—to the horror of the objectors just quoted—they treat the means as if they were the end. The usual success of this policy may perhaps be allowed to pass as an argument for its continuance. This view, of course, does not satisfy those who think that everything should be made pleasant to a child—that he should have no experience of difficulty, or trial, or *ennui.** Such is not, however, the spirit of the old system. We consider that the man who has not encountered and overcome difficulties is only half a man. Nor would we be so little friendly to the child as to remove them all from his path, and leave him unwarned and unprepared for those which he must meet with in his journey through life. If the result of the training be that the pupil comes forth from it firm in mind and limb, robust and well developed, in perfect health and capable of enduring fatigue, we may be well contented with these as the results of the process that he has gone through.

And now, before closing my paper, I would make a few remarks on the pretensions of science to supersede—for that is what some reformers aim at—the classical training of our schools. I have shown my appreciation of the great value of science, not only in itself, but as a means of education; but I confess that I have not, never having been enlightened on this point, a clear idea of the manner in which it is to be taught, so as to be a real mental discipline in schools. Those gentlemen—one of whom we proudly include in the governing body of our College—who a few years ago, at the Royal Institution, pleaded so eloquently the claims of chemistry,† physics, philology, physiology, and economic science, to be adopted in the curriculum as *branches of education for all classes*, meant of course that all these subjects were to be introduced. Even lately, two gentlemen, every way competent to speak upon the subject, have urged in this room the claims of botany and zoology as branches of education *for all classes*. We have, then—breaking up Professor Tyndall's "physics" into mechanics, hydrostatics, optics, pneumatics, sound, heat, &c.—some fifteen or twenty subjects claiming admission into the school curriculum. I again ask, how are they to be taught? Each of these accomplished men of course considers his own special subject as worthy of every attention, and would not be satisfied with the communication of a mere smattering of it as representing his idea of its value. Would any one of them be contented to hand over his subject to either Mr. Bentham or Mr. Spencer to teach? Certainly not. They would all wish the subjects which they know so well, which they appreciate so highly, and on which they have expended so much thought and labour themselves, to be thoroughly taught—to become a real possession of the pupil. But how is this to be done? That is the question, the satisfactory solution of which will do more to advance the claims of science to admission into the curriculum than all the arguments that have hitherto been adduced. We hear the pleadings in favour of each fair claimant for our regard, as she appears before us,—we admire her charms,—we admire all the charmers,—but we cannot marry them all; we cannot take them *all* for better, for worse, to have and to hold, &c.

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* This, too, is one of the notions of Mr. Spencer. Everything is to be made easy and delightful. He forgets that this is not really consistent with his own idea of education as a preparation for life. A practical teacher would remind him of the established dictum, *On ne s'instruit pas en s'amusant.* Every study is, indeed, to be rendered *interesting* to the pupil. The work of the teacher fails if he does not accomplish this. The apt teacher, however, succeeds, not by amusing his pupil, but by sympathising with him and thus gaining his confidence—by understanding and entering into his difficulties—by encouraging him with word or look, when he is puzzled,—never intruding help when it is not needed, never withholding it when it is.

† The lectures were delivered by Drs. Whewell, Faraday, Latham, Daubeny and Hodgson, and Messrs. Tyndall and Paget.

What, then, are we to do? We not only admit, but claim, the aid of science in education. That general enlightenment—that apt handling of business—"faculty," as some people call it; that appreciation of cause and effect; that comprehension of details under general laws; these, which are the proper fruits of scientific culture, would form the best corrective of Literature, would simplify and give a definite aim to her somewhat vague, though noble, aspirations. But the question returns, How is science to be taught? It will not be pretended that the scientific mind is formed by a lecture once a week on electricity or chemistry, as the case may be, nor by the occasional cramming of a text-book on the subject. The advocates of science mean something far transcending this, or they mean just nothing. But I am compelled to say that their utterances on the practical part of the subject are singularly vague and unsatisfactory. "Teach science," they say; but then Professor Huxley does not mean, teach Pneumatics: he means, teach Physiology. Professor Tyndall means by these words, Physics, and not Botany, and so on. Each thinks, and naturally enough, that his own special subject is the one to be taught, and therefore the general recommendation involves the teaching of them all, and we come back to the Chrestomathic idea which, presented *pur et simple* to these authorities in science, would be indignantly rejected. I have read with much interest the evidence given before the late Commission on Public Schools, by those eminent men, Carpenter, Lyell, Faraday, Hooker, Owen, Airey, and Acland. Whatever such men say must, of course, be interesting; but I confess that the impression left on my mind was not that of profound admiration for their practical "faculty." Their remarks and suggestions—very valuable, no doubt, as "hints"—leave the real difficulties of teaching science in schools untouched; and indeed will be found so various and inconsistent as frequently to neutralise one another. With very few exceptions, these eminent men scarcely seem to have perceived, or at least appreciated, the fundamental principle, that teaching science does not mean teaching electricity, or optics, or chemistry, or geology, but *training the mind to scientific method;* and that if all the "ologies," from A to Z, are to have a chance of occupying the field, a general *mêlée* will be the result, which will effectually frustrate the object. In that case, all the sciences might be *taught*—if that is the word for it—but science would not be *learned.* Dr. Acland's evidence is, however, very much to the point. He had clearly given thought to the subject, and handled it like a man of business. He recommended that Physics, Chemistry, and Physiology should be required of all educated men, and that the two former should be learnt at school. When reminded, however, that the Matriculation Examination of the London University comprised these and other cognate subjects, he gave an opinion, in which I confess I agree, upon the value of such scientific teaching as that examination pre-supposes. It is so much to the point that I will quote it:—"I may say, generally, that I should value all knowledge of these physical sciences very little indeed unless it was otherwise than book-work. If it is merely a question of getting up certain books, and being able to answer certain book-questions, that is merely an exercise of the memory of a very useless kind. The great object, though not the sole object, of the training should be to get the boys to observe and understand the action of matter in some department or another, and though I am perfectly aware that what is called practical knowledge, if merely manipulatory, on any subject whatever, is a humble thing enough, yet, on the other hand, I must say that the utmost amount of knowledge on these subjects, without that practical and experimental knowledge, is to most persons nearly as useless. You want the combination of the two; and for youths, I value very little the mere acquisition of a quantity of book-facts on these subjects. I want them to see and know the things, and in that way they will evoke many qualities of the mind which the study of these subjects is intended to develop." Thus speaks the true teacher and votary of science. His anxiety is to form the scientific mind, not merely to communicate information on science. From a great part of the evidence of the men whose names I just quoted you can only gather a commentary, by "eminent hands" certainly, on the text, "That the soul be without knowledge, it is not good;" which —though not a Solomon myself—I would supplement by adding, "That the soul attempt to grasp all knowledge, it is not wise."

Dr. Acland, it will be observed, recommends that chemistry be adopted as a general study; and from some little opportunity I have had of seeing that this subject may, to a certain extent, be adopted into the school course, I should have thought it a wise suggestion. But observe what a practical teacher of chemistry on a large scale, Dr. Völcker, of the Cirencester Agricultural College, says on this point:

> "As an educational means," he says, in a letter published by Mr. T. Dyke Acland, in a document prepared by the latter for the Commission, "chemistry is not to be compared with other means of training the mind. . . . The direct benefit resulting from the teaching of analytical chemistry in schools is *nil*. . . . I grant that two or three boys out of fifty may be benefited by practical instruction in experimental and analytical chemistry; but am also bound to add, that the rest only waste the time which may be more usefully employed. This is the result, not only of my own personal experience, but also that of many of my scientific friends in this country, at least of those who love science and desire its prosperity. Moreover, I would direct your attention to the fact, that the attempt has been make in Germany, on a large scale, to teach chemistry practically in schools for lads under sixteen years of age, and has proved so complete a failure that it has been all but universally abandoned in my native country.

It appears, then, that there are difficulties in the way of teaching science, even when the subject is well chosen, the field comparatively limited, and the means and appliances amply provided. Dr. Völcker's cold and dry experience does not perfectly accord with Mr. Spencer's enthusiastic theory, and does not go to prove that children eagerly hunger after scientific knowledge as they do after their daily food. Of course it is easy to throw the blame of failure on the teacher; but Dr. Völcker's words are too definite, and apply to too large an area to admit of this. Still, there can be no manner of doubt that science is immensely attractive; that it is favoured by the spirit of the age; and that it will and ought to be extensively taught in schools. But its educational advocates have, as yet, no practical plan involving good scientific discipline, and no well digested results, to show. Their voice will be powerful enough when they have, and will command the attention of all. As the case now stands, we have practice on the one side, and theory on the other. An amount of experience which no one can effectually gainsay attests the value of the Classical training; while an amount of theoretical plausibility, which no sane man can affect to despise, supports the claims of Science to a trial. Why should there not be a compromise? Intellectual education is strictly the training of all the mental faculties in the best way. Science teaches better, that is, more directly and thoroughly, than any other study, how to observe, how to arrange and classify, how to connect causes with effects, how to estimate the practical value of facts. Why not adopt it then as the proper complement of the literary element? Let botany be taught quite early in life,—in the first stage of instruction,—together with such parts of physics as give general views of science, and interest the mind in it. In the second stage, let some one or two branches of physics be taken as the basis of a sound training in science, with a view to the formation of the really scientific mind.* The classical course would thrive the better for the collateral study of science, and the scientific would thrive the better for the classical. Why should not both work harmoniously together in the curriculum.

The principle appears to be sound in general, that the spirit of the age should be represented in the education of our schools;—this is the reforming element of the question. At the same time it seems equally reasonable that we should not forego our hold on that mighty past of which the present is the legitimate offspring;—and this is the conservative element. It is well for the son, when prepared for the world of life, to leave his father's home and create one for himself. It is not well that he should do so too early, before he is prepared. Physical science may become—probably is destined to become—the organic representative of the civilisation of the age. At present it cannot be so considered; and its claims, therefore, to take the lead in the curriculum of education are inadmissible. While it is labouring to attain that position I would advise its votaries to aid those of classical instruction in securing the great advantages of the training I have recommended. The minds so prepared would be the fittest of all for sharing in the researches of science, and promoting its triumphs.

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* See Appendix, E.

APPENDIX.

A. (See page 249.)

In a very interesting address of Lord Ashburton's, at the Meeting of Schoolmasters in Manchester, in 1853, we find the following remarkable words:—"In this *progressive* country we neglect all that knowledge in which there is progress, to devote ourselves to those branches in which we are scarcely, if at all, superior to our ancestors. In this *practical* country, the knowledge of all that gives power over nature is left to be picked up by chance on a man's way through life. In this *religious* country, the knowledge of God's works forms no part of the education of the people, no part even of the accomplishments of a gentleman." It appears from this passage that Lord Ashburton does, after all, consider this to be a *progressive, practical*, and *religious* country, though nothing would seem to be done to make it so. The work goes on, and bravely too, in spite of the assumed general low level of attainments, and the indifference with regard to progress. Lord Ashburton does not see that there is, in fact, no "common measure" between the progress of a nation and that of an individual. The time may come when the progress of knowledge and the practical applications of it may be tenfold what they now are. But we shall still have to consider the average capacity of the race as a "constant quality," and frame our curriculum accordingly. The progress in question arises from the impulses generated in the minds of those who, being endowed beyond their fellows, stand forth as their leaders to the promised land; but the common mass have to begin at the beginning still in their instruction, just as if none had gone before them.

B. (See page 260.)

The following valuable remarks on the cultivation of the observing powers are from an "Introductory Lecture" on the Educational Uses of Museums, by the late Professor Edward Forbes, 1865:—

"The great defect of our systems of education is the neglect of the *educating* of the observing powers—a very distinct matter, be it noted, from scientific or industrial *instruction*. It is necessary to say this, since the confounding of the two is evident in many of the documents that have been published of late on these very important subjects. Many persons seem to fancy that the elements that should constitute a sound and manly education are antagonistic; that the cultivation of taste through purely literary studies, and of reasoning through logic and mathematics, one or both, is opposed to the training in the equally important matter of observation through those sciences that are descriptive and experimental. Surely this is an error. Partisanship of the one or other method, or rather department, of mental training, to the exclusion of the rest, is a narrow-minded and cramping view, from whatsoever point it be taken. Equal development and strengthening of all are required for the constitution of the complete mind; and it is full time that we should begin to do now what we ought to have done long ago."

C. (See page 265.)

"The purpose of Milton, as it seems, was to teach something more solid than the common literature of schools, by reading those authors that treat of physical subjects, such as the georgic (*i.e. agricultural*) and astronomical treatises of the ancients. This was a scheme of improvement which seems to have busied many literary projectors of that age. Cowley, who had more means than Milton of knowing what was wanting in the embellishments of life, formed the same plan of education in his imaginary college.

"But the truth is, that the knowledge of external nature, and the sciences which that knowledge requires or includes, are not the great or the frequent business of the human mind. Whether we provide for action or conversation, whether we wish to be useful or pleasing, the first requisite is the religious and moral knowledge of right and wrong; the next is an acquaintance with the history of mankind, and with those examples which may be said to embody truth and prove by events the reasonableness of opinions. Prudence and justice are virtues and excellences of all times and of all places; we are perpetually moralists, but we are geometricians only by chance. Our intercourse with intellectual nature is necessary; our speculations upon matter are voluntary and at leisure. Physiological (physical?) learning is of such rare emergence that a man may know another half his life without being able to estimate his skill in hydrostatics or astronomy; but his moral and prudential character immediately appears. Those authors, therefore, are to be read at schools that supply most maxims of prudence, most principles of moral truth, and most materials for conversation; and these purposes are best served by poets, orators, and historians." (Johnson's "Lives of Poets," vol. i, p. 92.)

D. (See page 271.)

Merely as a suggestion, the following scheme for the study of Latin may be proposed:—

1. Dr. W. Smith's Principia Latina, Parts I and II.
2. Cæsar—De Bello Gallico.
3. Virgil—Eclogæ, books 1, 3, 4, and 5.
   Georgica, books 1 and 2.
   Æneis, books 1, 2, 3, 6, and 12.
4. Cicero—Oratio pro Milone.
   Orationes in Catilinam.
   De Amicitia.
5. Livy, books 1 and 21.
6. Terence—Andria.
7. Tacitus—Agricola.
   Annales, books 1 and 2.
1. Horace—Odæ, Epistolæ, and Ars Poetica.

This matter should be thoroughly studied in the spirit of the method described in the text (pp. 266–272), and would require therefore to be gone over, parts of it at least—the Cæsar and Virgil—three times: first very slowly, weighing and investigating nearly every word; the second time less deliberately, improving the translation and enlarging the illustration; and the third time rapidly and in good English, so as to evince familiarity with both language and matter. The passages from Virgil and Horace should be committed to memory.

E. (See p. 279.)

Subjoined is a scheme of an amended curriculum:

FIRST STAGE OF INSTRUCTION.

(From about eight to twelve years of age.)

First Division (about two years).

1. Reading, Spelling, and Writing.
2. History, Scriptural and English.
3. Geography, Topographical and Physical.
4. French, Elementary Speaking and Reading.
5. Lessons on Objects.
6. Lessons on Words.
7. Arithmetic, chiefly mental.

Second Division (about two years).

Same subjects, as far as may be necessary, with—

1. Arithmetic, as an art generally.
2. Botany, Structural and Systematic.
3. Elementary Physics, general facts and phenomena.
4. English Grammar, Parsing and Analysis of Sentences.

SECOND STAGE OF INSTRUCTION.

(From about twelve to sixteen years of age.)

First Division (about two years).	Proportion of time, taking 40 hours per week for school-work.
1. Latin, taught as a training subject	20
2. French and German, practical mainly	5
3. Mathematics, especially Euclid	5
4. Physics, taught as a training subject	5
5. English Language and Literature	5
Second Division (about two years).	
1. Latin (time diminished)	10
2. French and German (time increased for more composition)	10
3. Mathematics—analytical, with practical applications ..	5
4. Chemistry or Human Physiology	10
5. English Language and Literature	5

Of course "Latin" and "English" both include the subjects—such as geography, history, archæology—which may be necessary for their illustration.

ON THE

IMPORTANCE AND NECESSITY

OF

IMPROVING OUR ORDINARY METHODS OF SCHOOL INSTRUCTION.

A Paper read at a Sessional Meeting of the Social Science Association.

ON THE

IMPORTANCE AND NECESSITY OF IMPROVING OUR ORDINARY METHODS OF SCHOOL INSTRUCTION.*

It is a fair proposition that the value of a given system of means, professedly adapted to secure a certain end, ought to be judged of by the results obtained through its ordinary working. These are, in fact, the test or measure of its efficiency; and if either in quantity or quality they fall greatly short of the calculated estimate, we decide that the system of means—the machinery in question—whatever may be its intrinsic theoretical value, is, on the whole, a failure. In speaking, however, of results of machinery, it must be distinctly understood that we speak of *average* results, and that the occurrence of extraordinary instances of success does not affect the general conclusion. It is obviously possible that these may be due to unusually favourable circumstances not contemplated by the theory of the machine, and therefore not due to its ordinary action. If, then, taking into account the entire working of any machine, we find that it fails more frequently than it succeeds, we have a right to say that the failures, not the successes, represent its true character, and hence to conclude either that the theory on which it is constructed is erroneous, and that it ought therefore to fail; or that, being good in theory, it fails because it is unskilfully worked. It is further possible that both these assumptions may be true; that the theory of construction may be erroneous, *and* the practical working of it unskilful.

Applying this illustration to our educational machinery generally, I fear it will be found that both allegations are well founded; that the theory which underlies the greater part of our practice is unsound, and that the practice is, generally speaking, unskilful, and therefore inefficient.

To discuss the theory of education generally is not my immediate object. I have considered it at some length in a lecture on the "Science of Education," delivered before the College of Preceptors, and to discuss it fully now would interfere with the business before us. It is sufficient for my present purpose to enunciate in general terms, that intellectual education—the branch of the subject which immediately concerns us—appears to consist in the development and training, by means of instruction, of the active powers of the pupil's mind, with a view to the attainment of knowledge and the formation of habits of thinking. If this view of education is correct, it must of course, be applicable wherever the process of teaching is going on, and therefore to every kind of instruction, and to every class of pupils. The man who keeps these objects steadily in view, and systematically aims at securing them, is a teacher in the proper sense of the term. He, on the other hand, who, from ignorance of the nature of the mind with which he is dealing, or from ignorance of the resources of his art, so operates as to quench rather than quicken intelligence —a frequent result of teaching—may bear the same conventional name, but belongs to a different class from the other. Dr. Hodgson tells us that at a meeting of this Association, some years ago, he heard one of the school inspectors declare that at certain schools he could tell pretty accurately by the pupils' faces how long they had been at school. The longer the period, the more stupid, vacant, and expressionless the face.*

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* Read Monday, June 3rd, 1872.

Without, however, dwelling longer at present on theory, I shall now endeavour to show, by facts, that the *average results* of our instruction, whether in primary, middle-class, or public schools, answer neither to the demands of the theory of education that I have suggested, nor to those of any theory which is worth the name (for all practice involves a theory of some kind), and that they show conclusively the importance, and, indeed, the necessity of some improvement in our ordinary methods of school instruction.

We notice, first, the results of primary instruction. It would be absurd, in this case, to apply our theoretical definition of education. It is not even conceived, as far as I can see, by the syllabus of the Education Department, that the children of our primary schools shall have their minds trained at all. Not a syllable appears in the instruction to lead us to infer that teaching has anything whatever to do with mind: the word even does not occur. What we do see is, that certain processes, which we may fitly call "grindings," are to be gone through, and that the quantity rather than the quality of the grist is to be periodically examined. All, indeed, that is demanded by the actual theory—if we may give it such a name—of primary instruction is that children (from the age of six to ten) shall, during the average term of four years of instruction, be qualified to pass the fourth standard of the Revised or New Code; *i.e.*, that they shall be able (I quote from the authorised instructions), (1) to "read a few lines of poetry or prose;" (2) "to write a sentence, slowly dictated once by a few words at a time, from a reading-book used in the first class of the school;" (3) to work sums "in the compound rules (common weights and measures) of arithmetic." This is all that is really required by our petty and ignominious theory of primary school instruction; and taking the minimum number of attendances of the children throughout the year at 200, and reckoning five hours of school for each day, we find in the four years about 4000 hours of practice allowed for carrying it out. Now, let us look at the results. According to the official Report of 1866–7, it appears that at the examinations in 1866, 264,231 children above ten were qualified by age and attendances to present themselves for examination, but for want of qualification by advancement only 161,773 were actually examined. Of these only 97,364 passed without failure above Standard *III*, which means, as the official Report tells us, that only 97,364 children above ten years of age passed the examination, instead of 264,231 who ought to have passed; and, consequently, "that the difference, 63 per cent., or nearly two-thirds, marks children passing out of school to work with less of elementary knowledge than Standard IV denotes." The reporters may well say, as they do with proper official calmness, "the general results of the individual examinations under the Revised Code still continue to show too backward a state of instruction."

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* "Exaggerated Estimates of Reading and Writing:" a Paper read at the Belfast meeting of the Association, 1867.

Things were much the same, if not worse, in 1870, the last year reported on. The reporters still call attention, in a marginal note, to the "unsatisfactory results of examination." Not without reason, as shown by the explanatory text, where we find these noticeable words: "If we confine our attention to the scholars above ten years of age, it further appears that out of every 100 of these elder scholars examined, only 64 per cent. passed without failure, although 129,331, or 44 per cent. of the number, were examined in the three lower standards (which I interpret as meaning that only 20 per cent., instead of 37 per cent., as in the former Report, of the scholars above ten years of age passed Standard III), "while," the Report proceeds, "those who passed without failure in the three higher standards were only 33 per cent. out of the 100." Surely these are very extraordinary products of the working of the prodigious machine called National Education: a machine evidently either so badly constructed or so badly worked that *it fails more than twice where it succeeds once.* Is this the sort of engineering that we find in the manufactories of Birmingham and Manchester? How long would the proprietors or directors put up with a machine which so signally defeated all their calculations?

In the presence of so notable a failure, it behoves us to inquire a little into the causes. The elements of the problem to be solved are, (1) School houses; (2) School apparatus; (3) School time; (4) The average intelligence of the pupils; (5) Methods of teaching. Now, we may safely eliminate the first three elements; as standing on both sides of the equation: nor will it be seriously pretended that English children, as compared with those of Switzerland and Saxony, for instance—countries in which it is rare to find a child, ten years of age, that cannot read, write, and cipher well—are exceptionally stupid.* Observe these children at their games and their amusements, at their school tricks and subterfuges; in their intercourse with each other. It is quite impossible to question their general intelligence, or to suppose them naturally incapable of acquiring, in 4000 hours of instruction, sufficient knowledge to pass the fourth standard. We are then, it appears, shut up to the conclusion that it is to the fifth element—the method of teaching, the working of the machinery—that we must look for the cause of the default; and for this the masters themselves are proximately, and the Education Department ultimately, responsible. In proposing this as the solution of the problem before us I shall, of course, raise up a host of opponents. I shall be told that, as the large majority of the teachers are certificated masters, they must be competent to teach. The answer to this plea is, that they obviously do not do what they are by theory competent to do; and the question still remaining for solution is, if they are not responsible for the failure, who or what is? and we are confronted by the absurdity of an effect without a cause. If this is really the condition of the question, we are of course doomed to failure: and in that case it would perhaps be more to the purpose, instead of bemoaning our hard fate, to yield to it at once, and give up the farce of national education altogether. The public revenue would be relieved of an immense and continually increasing burden; the army of teachers would be set free for employment in some more congenial sphere of labour; and the select band of accomplished gentlemen (highly-tempered razors, now occupied in the ignoble task of cutting blocks) who kindly do the work of finding out our faults for the contemptible sum of about 65,000*l.* a year, would probably meet with engagements better suited for the display of their exquisite attainments in Classics and High Mathematics; the children would exchange the dull lessons of the schoolroom for those taught by Nature in the open air and green fields and woodlands; and the average results of this change of plan (involving, at all events, a large general increase of happiness) would probably not very considerably differ —if accurately estimated—from those attained under our wonderful system of so-called education.

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* Mr. Hepworth Dixon, in his "Switzers" (p. 296), says, "Director Max Wirth, of Bern, assures me that no boy and no girl exists in this Confederation—save an idiot here and there—who cannot read and write;" and Mr. Mundella tells us that in Saxony he actually offered a premium (which he was never called on to pay) for the production of a child above ten years of age who could not read, write, and cipher well.

Turning away, however, our eyes from this glimpse of Elysium with a sigh, we come back to the hard reality of facts, and in their bare presence I ask, what other department of human industry is there in which the article manufactured so inadequately represents the immense cost and labour employed in its production?

I have referred incidentally to the inspectorship of our schools; but I wish to make a remark or two on this feature of our national system—a feature which strikingly brings out our how-not-to-do-it official spirit. One would think that the proper qualifications for an inspector of schools were, (1) A thoughtful study of education itself—what it is, what it might be expected to achieve; (2) A thorough acquaintance with school work, gained by long and successful experience, and involving, therefore, an eye practised to appreciate the merits and to detect the faults of the external machinery, as well as of the mode in which it is worked; and (3) A knowledge of the best methods of teaching generally, as practised in other countries, as well as in our own, with a view to the suggestion of improvements wherever needed in the schools actually under inspection. These being apparently the proper qualifications of an inspector of schools, we find, with no little amazement, that not one of them is looked upon as weighing a straw in the selection of our school inspectors. They are all absolutely set aside, and count for nothing as against the claims founded on the ability to write Greek iambics and solve differential equations! And hence we have school inspectors who, up to the moment of their appointment, may never have even set foot in a primary school; men destitute therefore of educational experience, of all knowledge or education, whether as a science or an art, and wanting, in short, every *essential* qualification for the task they undertake. It is no answer to this charge against the system, that some of them speedily, to some extent, qualify themselves. There is no doubt about that. I cannot, however, in justice to my own convictions, dismiss this subject without contending earnestly that these posts belong, of right, to the most intelligent, hard-working, experienced, and successful of the primary schoolmasters themselves; and that these men are defrauded by the present system of the reward justly due to their labours. What a stimulus would be given to the entire body of primary schoolmasters if a career were thus opened to them! Why, then, is it not done? Let the authorities at head-quarters answer the question. I shall not attempt it.

Having suggested the unsuitability and inadequacy of the methods of teaching employed in our primary schools, as the apparent cause of the failure in the ultimate result, and fixed the responsibility on the teachers themselves, we are bound to proceed forward in the inquiry, and endeavour to ascertain the nature and quality of the production "teacher," which is fabricated in the educational manufactories called training colleges. These institutions cost the country at the present moment about 100,000*l.* per annum. They are presided over and officered by men of high intelligence, large attainments, and much zeal. The machinery, then, viewed in relation to its professed object, is ample and sufficient. This can hardly be doubted. It is in these institutions that the teacher is to receive a true conception of the nature, aims, and ends of education, to acquire that culture which will fit him to direct the culture of others; and, moreover, to ascertain and be practised in those methods of securing culture which have been proved by experience to be the best. Such are the theoretical professions of a training college. I have carefully looked over the schemes of the training colleges, and I am bound to say that these professions form a constituent part of the machinery set forth—on paper. As, however, we are dealing not with paper theories, but with practical results, I must beg your attention to some of these, as derived from the Reports of Mr. Morgan Cowie and others, on the examinations conducted in 1870, in the twenty-two training colleges of England, Wales, and Scotland. We notice especially the Report on the examination of students of the second or final year of instruction; and we find that the general terms employed in describing the results are such as these: "Fell below a fair standard," "Did not pass creditably," "Did not acquit themselves creditably," "Did badly," &c.; and the subjects to which these remarks apply, are "grammar," "mental arithmetic," "geography," "Euclid," &c.; all being, in fact, ordinary subjects taught in the colleges. Passing, however, from the general to the special, we find in the tabulated results of the examination of male students of the second, *i.e.*, final year of instruction, in these twenty-two training colleges, some very extraordinary figures. These tables record the percentage of marks gained by those male students who were entitled to the epithets, "Excellent," "Good," and "Fair," and leave the rest out altogether; and it appears (to take only a few of the subjects) that in mental arithmetic the highest percentage of marks gained at any one of the colleges amounted to 32, in grammar 10, in geography 43, in Euclid 58; while the average percentage of all the colleges taken together, appears to be, in mental arithmetic 13, in grammar 3 (!), in geography 10, in Euclid 28. Now, whether we look at these remarkable figures as testing the soundness and efficiency of the teaching in these training colleges, or the industry and earnestness of the taught, they are well worthy of serious consideration. At all events, they help us greatly in the solution of the problem we were just discussing—the failure in the pupils' examination. We are no longer surprised at finding the pupils of such masters failing at the same or even a less rate; nor can we but entertain great doubts of the value of the average intellectual training which ends in such results as these. Notwithstanding, then, the great professions of the training colleges, we are forced to bring them to the practical test, "By their fruits ye shall know them," and to conclude that these institutions give a poor return for the funds expended on them. I am not unaware of the exceptions which may be taken to these conclusions, or of the explanations, or attempts at explanation, which may be given to extenuate what we must consider the true cause of the failure. I have, however, no time to discuss them in detail. But there is one especially which has been lately urged, which demands some consideration. It is, in brief, this, that the acknowledged failure in primary education is attributable not to the want of good teaching, but to Mr. Lowe's much abused Revised Code: that is to say, that the true reason why two-thirds of the pupils of primary schools go forth into the world with a "completed education," which consists in their being unable to pass the fourth standard, that is, to read accurately and intelligently, to write a decent hand, and to do sums in the compound rules, is to be found in the fact that they are not also taught history, geography, geometry, and physical science. Now I am not about to defend the curriculum of the Revised or of the New Code, which I honestly consider the meanest and the barest that ever was devised as the be-all and end-all of a system of primary education; but, at the same time, I must avow my inability to see the logical connection between the two facts. We all remember that, before the Revised Code was introduced, the curriculum was larger than it is now; and we also remember that the results of elementary instruction were even smaller than they are now, and that this fact constituted the strongest argument for the Revised Code. This plea, then, does not meet the case, nor solve the problem on which we are engaged. It was, however, argued with much force and plausibility by several of the most eminent principals of training colleges, in their evidence before the Commission on Scientific Instruction, that the teaching of physical science in primary schools and training colleges is the desideratum required to mend the present system and make it truly efficient. The value of instruction in physical science, even in the most elementary schools, and to the youngest children, I am so far from denying, that I strongly insist upon it—as may be seen in the paper which I read last year at the Leeds meeting of our Association—but to the inference that the introduction of science into the curriculum (especially if it were taught to no better effect than geography, grammar, and Euclid are now taught in the training colleges) would supply what is needed I as strongly demur. It is a singular fact that, having Mr. Cowie's report, with its striking implied condemnation of the system of teaching pursued in the training colleges generally, before them, the principals to whom I refer apparently ignored that report altogether; nor in any way, as far as I can see, guarded themselves against the quiet but decisive reprimand conveyed in these words of the Commissioners: "While we are clearly of opinion that scientific instruction should form a substantial part of the curriculum of training colleges, we feel the great difficulty which arises from the *present condition of the general instruction in those colleges*, as disclosed by the reports of the inspectors for the years 1870–71," *i.e.*, the reports from which I have already given some quotations. This reprimand, if it means anything, means, as addressed to the principals of the training colleges generally, "You ask for more subjects to teach. How have you taught those for which you are already responsible? You urge the value of physical science as an aid to intellectual development, but what sort of intellectual development have you secured by your methods of teaching other subjects manifestly, if not equally, suitable for the same purpose—and so on. I am not called upon myself to answer these awkward questions, but I cannot help thinking that they have a profound significance and well deserve a reply. I wish, however, to make a few remarks on the assumption that the great majority of the pupils in primary schools cannot be soundly instructed in reading, writing, and arithmetic, because the small minority are debarred from learning acoustics, electricity, &c. It has long been received as a fundamental principle of teaching that it is not so much the thing taught as the manner of teaching it that constitutes its value to the pupil. This principle is capable of the widest application, and extends to the teaching of the most elementary subjects; and I contend that the teacher who is shut up to the teaching of reading, writing, and arithmetic, may, if he is really instructed in his art, find in these simple subjects all the means absolutely required for developing, training, and informing the minds of his pupils. There are, for instance, methods of teaching reading which involve processes—to be performed by the pupil himself—of strict analytical investigation—methods of teaching writing, which train the hand, through the eye, in the imitation of form, and lay the first foundation of æsthetic culture—methods of teaching arithmetic, which develop valuable habits of reasoning, and of thinking generally—arithmetic being, as Dr. Hodgson has said, "at once a root science and a great power in education." The teacher, then, furnished with a high conception of the powers of his art, to begin with, well instructed moreover in the nature of those mental and moral forces, which he has every day to direct and control, thoroughly convinced, too, that the pupil's most fruitful efforts in learning must come from himself; and lastly, well acquainted with the methods of intellectual development which the experience of the masters of the didactic art have proved to be the best suited for the purpose, sits down to his task of teaching reading, writing, and arithmetic. Will such a teacher, in the nature of things, employ 4000 hours in his work, and leave it unaccomplished after all? Will he not do something more for his pupils than is now done by the general body of certificated masters in our primary schools? And we may further inquire whether the formation of such a teacher, by suitable means, is a conception too great and brilliant for us to entertain?

But there is something more to be said on this subject. While teachers of primary schools are complaining that they cannot teach reading, writing, and arithmetic for want of a more extended apparatus of means for teaching "higher subjects," they strangely forget that, within the covers of the books adapted to the six standards—with the addition of the Bible and History of England—there lies a fund of language-phenomena, in the examination of which they may find the fullest scope for the exercise of their own and their pupils' ingenuity. Any twenty pages, indeed, of these books contain illustrations of grammar, logic, rhetoric, psychology, philology, &c., which it would tax the resources of the profoundest scholar fully to exhaust; and are we to be told that the primary teacher cannot find material there for developing, training, informing, and fructifying the minds of his pupils, and for accomplishing, in short, the very ends for which he is a teacher?

Suppose that in successive stages of instruction ten pages only of each standard book were chosen, with the view of requiring that every sentence, clause, and even syllable in them should be thoroughly known and understood—known so that the child would distinctly recognise these elements whenever and wherever they afterwards occurred, and would mentally refer them into the place where they were first met with—known so that they would serve as examples of the rules of grammar, spelling, &c., from time to time brought before him. Suppose, too, that these words were, as far as possible, interpreted by the material objects, actions, and qualities which they represent. Suppose all this done—not by the telling of the teacher, but by the exercise of the child's own mind—by his own observation and analysis; and suppose him to be practised in putting together as well as pulling to pieces—in synthesis as well as analysis. Suppose, in short, that in every possible way his mind were exercised on the matter before him, so that he mastered it as a whole, and in its minutest details, do we not see that the very quickening of the attention to facts patent to the eye and appreciated by the mind, would of itself greatly lessen the difficulty of learning to read and spell—both for the most part matters of eyesight—and train the child generally to habits of observation? It is obvious that the child whose mind is disciplined even to the extent which I have suggested, is, by this thorough mastery of sixty pages of an ordinary book, *pro tanto*, an educated person, and that he can gain this education—the means for which are found in every schoolroom of the country—without spending a single penny on the machinery for "higher subjects." All that is really needed is the wise and skilful use of the means already provided, and this depends on teaching the teacher how to use them. That, however, is the gist of the whole question.

I venture then to doubt whether the mere enlargement of the curriculum for the benefit of the few would of itself supply the remedy we need for the default of the many, and especially if the new subjects were taught in the same spirit and to the same effect as the old ones. To teach the rudiments of science in the utterly unscientific, unenlightened manner in which other truths seem to be generally taught in our primary schools, would be a degradation of the very name of science. The true object of teaching science is to form the scientific mind; and the *only basis*—I speak advisedly—the *only basis* of science teaching is *the method of investigation*. We may struggle against admitting this proposition as we please, but we must return to it at last. Teaching science by books, by lecturing, by experiments performed by the lecturer, are all beside the mark; they do not teach the method of investigation. It may, however, be taught to the youngest child in the most elementary schools, and must be taught to such children and in such schools before the proper training required for technical education is secured. I cannot enlarge on this topic. I only remark further, that if the training colleges value the scientific method, I cannot understand why they do not teach other subjects in its spirit. Returning, however, to the immediate object of our inquiry, we may sum up its results thus far. If we cast our eyes from one end to the other of the vast system of agencies employed in our primary education, we notice (1) that the object aimed at is not secured. We fail twice as often as we succeed. We, therefore, naturally make the teachers and the methods of teaching they employ responsible for this result. We notice (2) that the teachers themselves are the product of a system of training which appears to fail *more than* twice as often as it succeeds. We, therefore, make the staff of teachers in the training colleges, the methods of teaching they employ, responsible for *this* result. We notice (3) that the training colleges are the product of the Education Department, the mainspring or *primum mobile* of the whole machine, and therefore fundamentally responsible for its entire working; and we notice, finally, that the Education Department itself is the product and embodiment of a theory of education, mean and limited in its scope, and unenlightened in its views; a theory which, carried out into practice, ignores the essential while it strenuously promotes the incidental; which earnestly stimulates mechanical and "didactic" teaching, and gives little or no encouragement to that which is intellectual, scientific, artistic, and which aims at culture. Such is the broad indictment which, after much examination of the facts, much practice in the art, much study of the theory of education, I venture to bring against the entire scheme of primary instruction in this country. I hope no attempt will be made to meet it by bringing forward notable exceptions. We have, strictly speaking, nothing to do with exceptions. We have to do with the rule, the general average; and my argument and statements can only be met by showing (1) that the theory is good; and (2) that the average practical results prove it to be so. This, in fact, is the gist of the whole question; for *efficient teaching implies the success of the great majority of the pupils, not the success of the small minority.* If, however, exceptions are to be taken into account, I turn away from the schools sanctioned by the Education Department, and point with pleasure and satisfaction to the late Dean Dawes's schools, at King's Somborne, the late Mr. Henslow's, in his quiet country parish, and to the Trade Schools at Bristol, all of which illustrate a totally different conception and style of teaching from those so elaborately pursued in our primary schools, though the pupils belong to the same class of society.

But I have dwelt at sufficient length on our primary school system, and I now call your attention to the general average results of middle-class education. These have not been tabulated and classified with the same degree of strictness as the former, but the incidental evidence is sufficient for our purpose:—

(1.) The youths examined for the Civil Service are the products of the ordinary teaching of middle-class schools, *plus* the cramming by which it is supplemented in view of a competitive examination. We find Sir John Shaw Lefevre, an examiner of such candidates, complaining bitterly, in 1861, of their "incredible failures in orthography," their "miserable writing," "their ignorance of arithmetic," and remarking: "It is comparatively rare to find a candidate who can add correctly a moderately long column of figures." Only a short time back, it was reported that out of 1,972 candidates who in the course of four years failed in the examination, 1,866 were rejected for bad spelling; and in the last Report of the Civil Service Commissioners, we see that out of 11,424 candidates, nearly if not quite all middle-class pupils, 5,696 failed to pass the examination.

(2.) At the first local examination under the Oxford schem

50 per cent. of the candidates failed in the simple preliminary examination, all being picked pupils expressly prepared for the competition. The proportion of failures has, I believe, since settled down to something less than one-third.

(3.) In 1869, a petition was presented to the House of Commons by the Council of Medical Education, complaining that "the maintenance of a sufficient medical education is very difficult, owing to the defective education given in the middle-class schools." At the same time, a similar petition was presented by the British Medical Association—a body numbering 4000 members; and another by the University of London, which stated that their examiners had been obliged for the previous ten years to reject 40 per cent.—since 1869, even 55 per cent.—of the candidates sent up for matriculation from middle-class schools.

(4.) Not a month ago, the Report of the examination in arts of the Apothecaries' Society showed that at their recent examination nearly 40 per cent. of the candidates sent up were rejected. The candidates in this case were of the average age of seventeen; and most of them had probably been submitted to strenuous cramming, to prepare them for the examination. This consisted of very easy pieces of Latin, taken from a book announced three months before; of short and easy pieces of English for re-translation; of a similar paper in French; of a few elementary questions in Latin and French grammar; of a paper on the first and second books of Euclid, without problems or exercises; of a paper on arithmetic to decimals, and one on algebra to simple equations—all matters which form the staple of instruction in middle-class schools. A writer in the "Pall Mall Gazette," May 1, thus comments on this examination:—

"It is not a little startling that of the pupils of the upper ranks of the schools at the age of seventeen, and after special training for the purpose, nearly one-half are found to have spent their lives thus far in a vain attempt to acquire the first elements of languages and figures. If this were a special and solitary case it would be surprising as a phenomenon, but we learn that it is something very like the rule. The experience of the examiners at the College of Surgeons is of a nearly equally discouraging character;" and he adds, "It will not," we believe, "be doubted, that such a percentage of rejections of young men specially trained for the examination of this simple kind is far from creditable, and betokens serious unsoundness in our educational system." If, however, we have any doubts on this point, they may be dispelled by reference to the voluminous report of the Schools Inquiry Commission. Failure! failure! is the clear verdict they pass on the average results of the teaching both in endowed and private middle-class schools. As to the former, the general Report, after quoting in detail numerous instances, thus sums up its judgment: "The foregoing account shows that the instruction given in the endowed schools is very far removed from what their founders could have anticipated, or from what the country has a right to expect. The districts assigned to our Assistant Commissioners embrace almost every diversity of character and population, yet the results appear very uniform." Again, "This unsatisfactory condition of secondary education is the natural consequence of the clearly proved absence, in a large number of cases, of the conditions of educational success. Untrained teachers and bad methods of teaching, uninspected work by workmen without adequate motive . . . could hardly lead to any other result." Of special Reports I can quote only one sentence, from Mr. Fitch's, on Yorkshire Endowed Schools: "Three-fourths of the scholars whom I have examined in endowed schools, if tested by the usual standard appropriate to boys of similar age under the Revised Code, would fail to pass the examination either in arithmetic or any other elementary subject" (Report, p. 133). The general Report on "Private Schools," though brief, is significant: "It appears to be too certain that a great proportion of the private schools are inefficient. All our evidence points to this conclusion with remarkable unanimity" (p. 654). A few special notes on private-school teaching may be given. Mr. Bryce says: "Not in more than three or four private schools in the whole country did I find that the main object of the teachers was to invigorate the mind by these robust studies (*i.e.*, Latin and mathematics);" and he speaks of the teaching of practical subjects as being "loose, confused, and irrational," and "of the want of anything which can give tenacity and clearness to the scholar's mind." Then we find Canon Norris, when asked what he conceived to be the general state of middle-class education, replying (Evidence, vol. i., 491). "My impression is that it is extremely unsatisfactory—most unsatisfactory."

Professor Rawlinson, as an examiner of boys sent up to the local examinations, after premising that these boys are "the pick of the middle-class," says: "I certainly think that the general condition of middle-class education must be very bad indeed, if this is the best," and particularly complains of "the want of sound elementary grounding." Then lastly, Mr. Moseley—a man of the has indeed been tacitly acknowledged, or if any reply has been attempted, it has consisted in fallaciously pointing to brilliant exceptions, and calling on us to regard them as the rule. Here, however, I once more apply the illustration with which I commenced, and contend that a system of machinery which only now and then accomplishes its object, and as a rule works immensely under its theoretical power, must be looked upon as a failure, and that therefore, speaking generally, the public-school system, as regards its average teaching, is in this predicament. Efficient instruction, I repeat, implies the success of the great majority of the pupils, not the success of the small minority.

While making the methods of teaching, and consequently the teachers of our public schools, in strict logic, responsible for the results described, I am not unaware of the peculiar difficulties arising from the indifference of parents, the firm hold of established traditionary plans of teaching, the rampant spirit of idleness prevalent amongst the pupils, and so on, which these teachers have to encounter. But while I know that many of them are men of high attainments, cultivated minds, large experience, and indefatigable industry, I have no choice but to apply to the great body of them the test, "by their fruits ye shall know them," and to conclude generally that they are unacquainted with the true art of teaching; for no other hypothesis meets all the facts of the case. It would not be difficult to show that in the nature of things it must be so. We have not in England even the pretence of that École Normale Supérieure, which, on the testimony of the Schools Inquiry Commission, "annually supplies the French schools with teachers not surpassed in the world;" nor even the shadow of that careful system of teaching and training by which the German teacher is prepared for his career. With us all is left to haphazard and chance. The teacher is chosen not because he knows anything of teaching, or the management of a class—on which so much depends—but because he is a first-class man, and we blindly give ourselves up to that egregious *non sequitur*, "he knows; therefore he can teach what he knows"—one of the most remarkable educational fallacies that ever blinded the eyes of sensible men. He sits down to his work, conscious of his high qualifications in scholarship, but not conscious that he is merely a raw recruit in teaching. Having long forgotten the time when small difficulties in learning proved great impediments to his course, he has little sympathy with the boys before him who are in the condition in which he was then. He is, first, surprised at, then resents, what appears to him wanton

The theory of the system, however, as far as it goes, seems simple enough, and is not wanting in a certain air of plausibility. It is this, that by the thorough study and mastery of Latin and Greek the mind is so quickened, developed, and trained, that in the process a sound knowledge of these subjects is gained, and what is more important, an aptitude and skill, which, as a matter of course, make the ordinary subjects of instruction easy of attainment, and in point of fact ensure their attainment. This is the theory; but the practice founded upon it and its actual average results wofully belie it. The premises indeed are not justified by the facts of the case. The languages, the mastering of which is, by the theory, to secure intellectual training, and all its consequent benefits, are not generally mastered—their rudiments even are not generally mastered, at the public schools. The proofs of this assertion are to be found abundantly in the Report and evidence furnished by the Public Schools Commission of 1864, and are such as cannot possibly be gainsaid or set aside. Several distinguished public tutors and examiners of Oxford and Cambridge, having the opportunity of examining young men on their entrance to the university course, declare that the average of youths admitted from the public schools are "badly grounded;" are "in knowledge absolute ignoramuses," "have everything to learn, and little desire to learn anything," "have few intellectual tastes," have "very unawakened minds, and habits of mental indolence and inaccuracy," require "their shortcomings to be supplemented by the university teaching," which is therefore "hampered" by interference with its own proper work, evince "surprising ignorance on points not strictly academical," are "deplorably ignorant of English literature, English history, and English composition," "read worse than the majority of pupil teachers in elementary schools," and often spell flagrantly ill.

These, then, it appears are the average practical results of the noble theory which promised so much, and the results, be it remembered, in the case of those who go from the public schools to enter on the university course, being a selection—about one-third—of the total number who leave those schools. It would be interesting to ascertain the mental condition and furniture of those who never enter the universities at all.

Now these statements, so damaging to the theory of public-school teaching, and so condemnatory of the methods by which it is carried out, have never, as far as I know, been challenged; their substantial accuracy with regard to the average of the pupils has indeed been tacitly acknowledged, or if any reply has been attempted, it has consisted in fallaciously pointing to brilliant exceptions, and calling on us to regard them as the rule. Here, however, I once more apply the illustration with which I commenced, and contend that a system of machinery which only now and then accomplishes its object, and as a rule works immensely under its theoretical power, must be looked upon as a failure, and that therefore, speaking generally, the public-school system, as regards its average teaching, is in this predicament. Efficient instruction, I repeat, implies the success of the great majority of the pupils, not the success of the small minority.

While making the methods of teaching, and consequently the teachers of our public schools, in strict logic, responsible for the results described, I am not unaware of the peculiar difficulties arising from the indifference of parents, the firm hold of established traditionary plans of teaching, the rampant spirit of idleness prevalent amongst the pupils, and so on, which these teachers have to encounter. But while I know that many of them are men of high attainments, cultivated minds, large experience, and indefatigable industry, I have no choice but to apply to the great body of them the test, "by their fruits ye shall know them," and to conclude generally that they are unacquainted with the true art of teaching; for no other hypothesis meets all the facts of the case. It would not be difficult to show that in the nature of things it must be so. We have not in England even the pretence of that École Normale Supérieure, which, on the testimony of the Schools Inquiry Commission, "annually supplies the French schools with teachers not surpassed in the world;" nor even the shadow of that careful system of teaching and training by which the German teacher is prepared for his career. With us all is left to haphazard and chance. The teacher is chosen not because he knows anything of teaching, or the management of a class—on which so much depends—but because he is a first-class man, and we blindly give ourselves up to that egregious *non sequitur*, "he knows; therefore he can teach what he knows"—one of the most remarkable educational fallacies that ever blinded the eyes of sensible men. He sits down to his work, conscious of his high qualifications in scholarship, but not conscious that he is merely a raw recruit in teaching. Having long forgotten the time when small difficulties in learning proved great impediments to his course, he has little sympathy with the boys before him who are in the condition in which he was then. He is, first, surprised at, then resents, what appears to him wanton or wilful indifference or crass stupidity, misunderstands his pupils, and forces them, by the measures he adopts, to misunderstand him, and so goes on blundering and floundering through difficulties really inherent in his work, which nothing whatever in his scholastic career has prepared him to deal with; and so on. I cannot further follow him in his course; but we are told by a distinguished master of a public school, that this sort of trial—a trial also for the pupils—continues on an average for about two years, during which time the teacher is learning his profession in a great measure at the expense of his pupils. If, however, it should happen that on the average the masters do not stay longer than two years at the same school, we see that the pupils have the questionable advantage of being placed under a constant succession of raw recruits. This, I know, is in some schools the fact, and, taken in connection with the previous remarks, goes far to confirm the general assertion, that the great bulk of the masters of our public schools are unacquainted with the true art of teaching: a supposition which serves to explain in a great measure the deplorable results of the teaching. But I must leave the case of the public schools, simply insisting on the importance and necessity of some decided improvement in their methods.

Glancing back over the whole field that we have traversed, including primary, secondary, and higher education, we cannot but see—(1) That the results, considered merely as mechanical, answer to no estimated calculation of the working power; and (2) That the general practice corresponds to no theory that we can construct of the resources and capabilities of intellectual education. We see, in fact, to use Mr. Gladstone's compendious travesty of Goldsmith's lines—that

> "Boys learn but little here below,
> And learn that little ill."

The results, in short, condemn the methods by which they have been obtained, and the methods condemn the theory on which they are founded. Good methods could not have produced such results—a good theory could not have suggested such methods. The improvement, then, that is needed must begin at the beginning, and involves an entirely different conception of the nature and powers of education from that which usually prevails among teachers. We must begin by setting aside the commonly received notion that teaching consists in the communication of the teacher's knowledge to the pupil by didactically cramming him with it, and by putting in its place the notion that it rather consists in encouraging and aiding the pupil to gather knowledge for himself; viewing the child as an investigator, whose mind, by being brought into direct contact with facts, is to be stimulated to that exercise of the faculties which investigation at first hand requires. This single consideration, if rightly estimated, revolutionizes the entire machinery of teaching. (1) It transfers the essential process on which success depends from the teacher to the pupil, who is, in fact, teaching himself by means of the facts with which he is dealing—the facts themselves being the true teachers. (2) It explodes the notion of supplying the child's mind with rules, formulæ and abstractions, derived from facts not yet within his knowledge. As an investigator he can only arrive at the abstract through the concrete. (3) It places the teacher in his true and proper relation to the learner. The learner, not the teacher, has to go through all the intellectual processes by which his mind is instructed and educated: and the teacher who has gone through them himself, and therefore knows them, is to direct and guide—not in any way to supersede—the process of the learner. The teacher's business, in short, is by his action and influence to make the pupil his own teacher.

Without dwelling longer on these points, I beg to refer those who are interested in them to Miss Youmans's "Essay on the Culture of the Observing Powers of Children," just published by Messrs. King, and to the supplementary remarks which, as editor, I have appended to it. Miss Youmans, with a view to secure the mental discipline at which I have hinted, proposes Botany as "a fourth fundamental branch of study, which shall afford a systematic training of the observing powers;" and shows in a very interesting manner how it may be pursued so as "to secure the formation of ideas by the study of facts."

If the views which I have presented are correct, they point directly to the reform which is needed. The teacher must be taught how to teach. Like every other professional man, he must be prepared for his profession by careful special training. This training to be complete involves, in addition to a sound knowledge of the subject he has to teach, a knowledge of mental, moral, and physiological phenomena; phenomena such as in every variety of complication he will meet with and have to deal with throughout his entire educational experience. It may seem strange that a lecturer on education should have to insist upon the proposition as if it were new and unheard of—that a man whose whole business in life is to train the mind, whose profession is distinguished from all others by this speciality, should have a scientific acquaintance with mental phenômena. Yet so it is. In the case of an ordinary material machine of delicate and complicated construction, we require the engineer who is to guide it to give proofs of his theoretical and practical knowledge of mechanics generally, and of this peculiar kind of machine especially, before we intrust him with it; but in the case of the engineer of mind, we generally require no certificate of competency whatever. The equipment of the teacher, however, is incomplete without a sound, however limited, knowledge of the principles of Psychology (including Logic) Ethics, and Human Physiology. On the importance of these sciences as lying at the foundation of the science of education—as forming therefore a proper part of the equipment of the teacher—I have no time to dwell. I will only mention that the examination of teachers at the College of Preceptors requires a competent knowledge of them all.

The theories of teaching now in vogue amongst us have had a sufficient trial. We have seen their practical results in the evidence brought before us this evening; we see them everywhere around us, in eyes which do not see, ears which do not hear, minds which have never been taught to think. Their prominent characteristics are these. They assume the native incapacity of a child to comprehend simple truths without endless telling, explaining, and thinking for him; they tend to repress instead of aiding the natural development of his mind; they surfeit him with technicalities, abstractions, and routine, and make him a slave of rules instead of a master of principles; they cultivate the lowest faculties at the expense of the highest; and finally, and naturally, they give as their total product, results which I venture to describe generally as "a farrago of facts imperfectly apprehended, and only partially hatched into principles; of principles and rules divorced from the facts they represent; of exceptions claiming equal rank with the rules; of definitions dislocated from the objects they define; and of technicalities which clog rather than facilitate the operations of the mind."

Let us look for a moment at the other theory, the leading features of which I have already indicated. It assumes that the child is naturally endowed with intellectual capacity, with vital forces, which it is the business of the teacher to elicit, develop, and turn to good account. It exercises these faculties on matters of fact within his scope and comprehension. It calls upon him to employ on these matters of fact the powers of observation, comparison, &c.,

with which Nature has endowed him. It confines him, in the first stage of instruction, to those concrete matters which he can examine by means of his own senses, which he can see, handle, hear, smell, experiment with, himself; matters which form a part of his ordinary experience ("that," to use Milton's words, "which before us lies in daily life," "to know which," he says, is "the prime wisdom"); and treats as "cram" rules, formulæ, definitions, abstractions, general principles, scientific digests, dictionary meanings of words, &c.; all matters which he has had no hand in framing; all indigestible by his mind in its unformed condition; and all, therefore, to be relegated to a subsequent stage of instruction.

This theory next makes him a pupil of the inductive method. It requires him to reflect and reason on the facts that he knows, to take his first steps in generalisation, and gradually to make his way towards its higher stages, while all the time synthesis working conjointly with analysis consolidates the acquisitions made, and renders them permanent possessions of the mind. This theory, it may be remarked by the way, does not regard memory as a separate mental faculty, to whose charge we are to "commit" the results obtained. It rather looks upon facts as already committed to memory when they are thoroughly comprehended by the reason, though it sanctions and enforces the retention, by frequent *memoriter* repetition, of the facts that have been thus gained.

This theory, in the next place, requires the pupil, already practised to some extent in rule and definition-making, and in generalisation, to avail himself of the rules, definitions, and generalisations of others, to examine into their meaning, and to test their accuracy by his own knowlege; lastly, to deal with deductive propositions and trace them to the facts and principles which they represent. But I cannot enter into details.

It is obvious that these theories of education are inconsistent with each other. They rest on different foundations, and they must end in different practical results.

The conclusion of the whole matter is, that our ordinary methods of school instruction appear to fail in their object, and to fail for want of better teachers. How the teachers shall be more efficiently prepared for their difficult and exquisite art—this appears to be the question of questions as regards the educational future of England.

ON THE

PAST, PRESENT, AND FUTURE

OF THE

COLLEGE OF PRECEPTORS.

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THINKING that it might be interesting to the present Members of the College of Preceptors to know something of its early history, and that, in presenting some of the details of that history, I might find a suitable occasion for a few remarks on its present, and a few speculations upon its future, position, I have ventured on introducing this subject to you this evening.

If the historian of an institution is the better qualified for his task by having been present at its birth, almost at its conception, and by having taken a warm and sympathetic interest in its various fortunes ever since, I hope I may without arrogance claim a right, not possessed by all its supporters, to speak both of the successes and failures of the College of Preceptors.

I have said that I was present at the birth of the institution. I may add, that before that important event I was in attendance, taking my part, more however as a listener than as a talker, in the gossip which generally goes on when a birth is expected, and which becomes greatly intensified when the bantling proclaims his own existence, and begins to be an object of observation and interest to others beyond the family circle.

At that time I certainly shared profoundly in the hopes that were entertained by the promoters of the institution, that it would advance steadily and strongly, and would do much to justify its own existence and pretensions, and to prove that those who had so earnestly laboured in fostering it had achieved a great service to society.

Looking back, however, now, on its growth and so-called maturity—at the results actually attained—one cannot help doubting whether the child has repaid its parents for all their anxious care and nursing; whether, indeed, the best has been made of the faculties with which it was endowed—a serious consideration in the

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* Paper read at an Evening Meeting of the College of Preceptors, June 17, 1868.

case of an institution, as well as in that of a child grown up to manhood.

On one point connected with the origin of the College of Preceptors I have a very strong conviction, which I cannot, without doing injustice to my feelings, repress; and that is, that the motive which prompted the laborious exertions, as well as the sacrifice of time and money, of the original promoters, was a simple and disinterested desire to effect a valuable service for their fellow-teachers and for society at large. And I must not, in this connection, keep undeclared another conviction which I hold as strongly, viz., that the outside critics of the College have frequently failed to do justice to the sincerity and good faith which have, as a general rule, actuated the directors of the institution. The College of Preceptors has not, it is generally agreed, obtained the standing which was expected for it by its friends; the direction and management have been sometimes feeble and inefficient, and many very important objects, which lay especially within its province, remain even now unaccomplished. Still the failure cannot be attributed to want of good faith and principle on the part of the Council, but is rather due to the want of an adequate response on the part of those who were intended to benefit by its arrangements. The fact indeed can hardly be disputed, that the College was, and still is, in advance of the age; and hence, like all institutions which endeavour to do for society a service which society cannot appreciate, must wait for the favourable breeze of public opinion. When that breeze springs up, the College will recur to those first principles, which it has in the course of time somewhat lost sight of, and will, with a well-devised machinery already organised, be prepared both to obey and to direct the great educational movement to which so many signs of the times are now pointing.

It may be well, now, to give some idea of the origin of the institution. It commenced at Brighton, where a few schoolmasters, after a mutual discussion of the *idée mère* of the College, viz., the desirableness of *an institution which should provide a better class of teachers*, formed a Provisional Committee, which, in February, 1846, was thus constituted:—*Chairman*: H. S. Turrell, Esq. *Members*: Rev. W. H. Butler, Rev. R. Lee, Messrs. J. Wharton, J. Andrews, J. P. Hall, D. Gunton, R. Stokes, J. Sansbury, and J. T. Coleman. After various meetings at Brighton, this Committee called one in London, where it was resolved to invite the attendance of members of the profession at a General Meeting, to be held at the Freemasons' Tavern. This meeting accordingly took place on the 20th June, 1846. Mr. Turrell was the chairman; and the following amongst other resolutions were adopted:—

"1. That, in the opinion of this meeting, it is desirable for the protection of the interests both of the scholastic profession and the public, that some proof of qualification, both as to the amount of knowledge and the art of conveying it to others, should be required, from and after a certain time to be hereafter specified, of all persons who may be desirous of entering the profession; and that the test, in the first instance, be applied to Assistant Masters only.

"2. That, in the opinion of this meeting, the test of qualification should be referred to a legally authorised or corporate body, or college, consisting of persons engaged in tuition.

"3. That for the purpose of effecting this object—viz., the formation of a corporate body—the members of the profession who enrol their names at this meeting, do resolve themselves, and are hereby resolved, into the COLLEGE OF PRECEPTORS; and that those persons now enrolled, or who may hereafter be enrolled, shall incur no liability beyond the amount of their respective annual subscriptions.

"4. That a Council, consisting of the members of the Provisional Committee, with power to add to their number, be now appointed for the purpose of conducting the business of the institution, and that Mr. Turrell be appointed President of the Council."

It is worth while to pause a moment here to consider the clear and precise object for which the College was established. That object, *pur et simple*, was the testing of the qualifications of teachers, with a view to the protection both of the scholastic profession and of the public. This test was to be applied by a legally authorised or corporate body, and that body was the College of Preceptors. Now it does appear to me, that there was great disinterestedness and simplicity in the *idée mère* of the institution; and it would probably have been well for its success if that idea had been strictly adhered to. It would not, in that case, have been necessary, as it is, to confess that an institution founded *ad hoc*, has, in the course of 22 years, actually certificated a mere handful of teachers.* In the first year 24 passed the examination; in the second, about 16; in the third, fewer still, and so on until we find the yearly average of the last seven years to be *four*. The fact is, that the test, which was "to be applied in the first instance to assistant masters only," has scarcely ever been applied to any others, and to these only to the insignificant extent which I have just indicated. There is no doubt that it was a capital blunder, and a blunder that good intentions do not excuse, to omit the naming of a certain date, after which none, whether assistant masters or principals, should be admitted as members without examination; or at all events, not to have made a clear distinction, which the public in general could not fail to appreciate, between examined and unexamined members, regarding the latter class merely as subscribers. Not only, however, was this not done, but a positive sanction was given to the assumption against which the public has frequently protested, by declaring in the Bye-Laws, adopted at the general meetings held in London, July 16 and Dec. 30, 1846, that—

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* It has been calculated, for exact information cannot be obtained, that the total number certificated is about five hundred.

"1. All Schoolmasters who join the College prior to Jan. 1, 1847, shall have the *highest rank* the College confers, namely, M.C.P.

"All Assistant Masters, who pass the highest test, either in Classics or Mathematics, shall have the same rank as Principals, namely, M.C.P."

It was also stated that those Assistant Masters who passed in other subjects should be entitled to the *second rank*, namely, A.C.P. (*i.e.*, Associate of the College of Preceptors).

Had these arrangements been merely *ad interim*, something might have been said for them; but knowing as we now do that the so-called temporary arrangement became perpetual, and has never been positively rescinded, can any one wonder that the public should from time to time protest against what frequently amounted to a sanction of ignorance and incompetence, given by an institution especially founded for the purpose of testing qualifications, and inquire into the real meaning of the mystic appendage, M.C.P. Again, can any one wonder that schoolmasters by hundreds, finding that *high rank* in a learned corporation was to be obtained at the rate of seven shillings a letter (for in many instances the first payment was also the last) should have availed themselves of the golden opportunity. Never before could diplomas (for so they were called) be obtained on such easy terms as these. It is difficult now to say why that which was unavoidable at first (for even Romulus was obliged to begin with proclaiming an asylum for all sorts of people in order to commence his kingdom) was allowed to become established, and to lead in practice to a complete perversion of the very principle which the College was instituted to maintain. The only excuse I can find or frame is this—that the immense quantity of business which soon began to pour in upon the Council, the great number of members that offered themselves for enrolment, the establishment of local boards all over the country, the sending of deputies to different towns to explain the objects of the College, the formation of an examining body, the drawing up of examination papers, &c., &c., involved them in an amount of positive labour which for a considerable time hid from their sight the original principle to which everything else was to have been held subordinate. It cannot be questioned certainly that, under their able, energetic, and high-minded President, the Council did get through an amazing quantity of work. Those who talk in the present day of what the College is doing have little idea of what it did in those early days. The single fact that, in the course of six months after the meeting in Freemasons' Hall, sixty members had grown into six hundred, and in twelve months to one thousand, is a sufficient proof of the popularity of the College with the profession; while the numerously attended meetings held in various parts of the country, the establishment of nearly seventy local boards, each with its honorary secretary, and the patronage of men of distinguished position, showed that it was appreciated by the general public. If I were so constituted as to attach a great degree of importance to names, I should dwell more complacently than I can do on the fact —which, however, ought to be stated—that the Patron was the late Marquis of Northampton, a man whose rank among peers was his least distinction; and that among the Vice-Patrons were Lord Dudley Coutts Stuart, Sir John William Lubbock, Messrs. Ewart, Godson, Ormsby Gore, Hastie, Mackinnon, Romilly, Wyse, Aglionby, Brotherton, Members of Parliament; Sir R. Westmacott, Serjeant Talfourd, Davenport Hill, Dr. Latham, J. W. Gilbart, and J. J. Sylvester. I do not, I repeat, attach much importance to the enrolment of aristocratic names in connection with a literary or educational institution. I have long believed that there is a sort of degradation in receiving *patronage* at all—from a strong conviction, that a man or institution that is really worthy of patronage does not want it, and that one that is unworthy cannot be made worthy by any amount of patronage. Let a man's works praise him, and he gains the highest praise. This is only an individual opinion, I allow, but it is justified in the present instance by the results. I never heard that the College was aided in any way to the accomplishment of its object by its patrons, except perhaps in the obtaining of the Charter; and that achievement was, in the opinion of many friends of the institution, scarcely worth 500 pence out of the 500 pounds which it cost. But I have not yet done full justice to the efforts of the Council of 1846–7. In addition to the objects already enumerated, they appointed a committee to superintend the formation of a collateral Institution for Ladies; and they had a goodly show of Lady Patronesses to keep the Patrons in countenance. There are the Dowager Marchioness of Cornwallis, Lady Charlotte Lyndsay, the Hon. Miss Murray, Lady Wilson, Lady Palmer, Lady Domville, and the at least equally distinguished names of Miss Edgeworth, Miss Corner, Mrs. Ellis, Mrs. Marcet, Miss Stodart, and Miss M. A. Strickland. This feature of the College, which it afterwards managed to lose, was at that time very promising, and subsequently attained a considerable amount of success. A good deal was at that time said, and something done, in the interest of female education. An effective committee was formed, and this collateral institution may claim a portion, at all events, of the merit of labouring in a field which at last seems likely to produce a crop.

The Benevolent Fund was also projected at this time, and gave, even then, *quite as much* aid to "aged, distressed, and afflicted schoolmasters," as it has done ever since. The authority on which I am relying for the foregoing facts also tells us that on the 3rd of April, 1847, the registration books of the Agency Department were first opened.

It remains only to add, that the Examining Board included the names of the Rev. Dr. Wilson, of Chelsea, Rev. G. W. Stoddart, and Mr. Eccleston, for Classics; Rev. J. Hind, Mr. Wharton, and Mr. Boole, for Mathematics; and Messrs. Delille, Wattez, and Gassion for French;—that there was a special examination in the Theory and Practice of Education, and that the first two or three papers in that department were, at the request of the Dean, drawn up by myself. Twenty-four candidates passed at the first examination in January, 1847. How many presented themselves I do not know. A characteristic address, from the Senior Moderator, the Rev. Dr. Wilson, closed the proceedings connected with the first examination; and in the compliments bestowed on the "learning and ability" displayed by several of the candidates, as well on the great "judgment and knowledge of the human heart," attributed by implication to the examiners, we detect the *couleur de rose* which was suffused at that epoch over the budding hopes and aspirations of the College. Even then, however, complaints appear of "invidious attempts" that were made to dim those rosy tints; such attempts, however, only serving as a stimulus to the enthusiasm which was enlisted on the side of "our truly glorious institution."

It is a noticeable fact, that among the earliest manifestoes of the College were resolutions unanimously passed at a General Meeting, held at the Freemasons' Tavern, on the 14th January, 1847, which asserted the principle of "perfect freedom in education," in opposition to Government interference, and invited support for the College on the ground of its independent and unsectarian character. These professions of the College, it is almost needless to say, elicited opposition as well as support. At a public meeting at Manchester, addressed by several very eminent men, an amendment on one of the resolutions was moved, utterly condemning the principle of freedom in education, and charging the College with something akin to disaffection or sedition towards the Government. It was also charged in the public prints with the crime of dissociating religion from education, and of endeavouring to prove that lay schoolmasters might be as good as, nay—such was the audacity of the College—better than, some clerical.

One or two points in the "Rules and Regulations" of 1846–7 may be worth attention, as showing that alteration is not always improvement. Then, as now, the regulation respecting the election of the President and Vice-Presidents of the Council was, that they should be elected annually. But then, and not now, it was ruled that each of the Vice-Presidents should go out of office annually, and *not be eligible for re-election until after the lapse of one year.* Then, the Vice-Presidents were elected—as I think they ought to be—by the *members of the College*, and not by the *members of the Council.* Then, one fourth of the members of the Council were to go out of office annually, and *not to be eligible for re-election until after the lapse of one year.* In short, at that time the democratic element was in greater force than it is now; and the provisions made against the Council's becoming practically a sort of Select Vestry more efficacious. Nothing can, in my own opinion, tend more to the deterioration of races, councils, or directing bodies generally—and I include political rulers in the same category—than the practice of *breeding in and in*, which, unless strongly guarded against, is almost inevitable. At the same time I am bound to say, that the task of providing against this cause of deterioration rests with the main body of the members, rather than with the Council—who are obliged to fill up their numbers, and of course with nominees of their own, unless others are presented to them by the popular body. The College of Preceptors, however, is not the only instance of a popular constitution aristocratically managed, showing a practical abnegation of the privileges conferred by the constitution. Whether this inaction arises from indifference, or even from perfect confidence, it is in itself a symptom of decay. Solon, it will be remembered, punished the citizens who showed indifference to the welfare of the state; and I cannot but believe that a constitution is then most flourishing when it is continually receiving fresh blood into its veins wherewith to maintain and stimulate its vital power.

I ought to add, in closing the annals of the eventful period 1846–7, that on the 2nd October of the latter year the "Educational Times" first commenced its chequered existence. It does not lie in my way to criticise this periodical, which has had many difficulties to contend with; but I must express my individual and personal regret that education should be in England so small a matter of concern, for its own sake, to the great body of educators, that no journal of this kind, however well conducted, has ever paid the expenses of its projectors. Every other civilised nation but England —"the least educated of all"—supports many (Germany forty or fifty) such publications.

In the Calendar of the College of Preceptors for 1847, to which I am largely indebted for the preceding narrative, I find reference made to the assumed immense importance to the well-being of the College of a Royal Charter of Incorporation, in order—these are the words—"that the scholastic body of this kingdom may in truth be a profession, and be equally on a recognised position as" (this English is not mine) "the Clerical, Legal, and Medical professions." The idea, once started, was not allowed to fail for want of support; and we soon hear of subscriptions coming in from all sides to defray the expenses connected with it. The fact that it was necessary to pay more than 500*l.* in hard cash to lawyers to procure a sanction from Victoria, Queen, Defender of the Faith, to a body of men seeking nothing for themselves personally, but only "to promote sound learning and advance the interests of education," is one of those strange anomalies which, with a crowd of others, we shall leave for the amusement of our successors. Of course, the policy of giving any body of men such rights,—to confer diplomas, &c.,—as were asked for, might fairly be questioned; but if the disinterestedness of the promoters was unquestionable, if their object was the public good, and if on these grounds the Government thought fit to grant those special privileges, then to load, or allow to be loaded, the favour with fees, impositions, and embargoes of one kind or another to the amount of hundreds of pounds, was a scandal and a shame. However, the enthusiastic promoters of the College had made up their minds that this Charter would have the magical power of constituting the members *ipso facto* a professional guild, to whose prestige, thus sanctioned, all teachers would do homage. The enthusiastic promoters alluded to, I am bound to say, nobly supported their arguments by their subscriptions, and maintained, by so doing, that character for disinterestedness which, through the various vicissitudes of the College, has distinguished by far the larger number of them.

It is surely a sight of no ordinary interest which we have before us in the College of Preceptors of 1847. The measures I have referred to are being pursued with extraordinary earnestness and energy, and so much approved of by a largely increasing *clientèle*, that in September, 1847, the members are spoken of as having increased to above a thousand. The great difficulty, however, was then, as it is now, to excite a corresponding interest among those for whom it is not too much to say that the whole machinery had been set in motion. It is so important to make this point evident, that I will quote a sentence or two from a letter published in the first number of the "Educational Times," in which the writer, one of the Council, using italics and capitals to emphasise his words, earnestly insists :—"That the *grand fundamental principle* or object of the College of Preceptors is to guarantee to the British public a number of Masters, possessing not only adequate literary and scientific attainments, but also *didactic* knowledge, skill, and experience." "This principle," he goes on to say, with even a redundancy of words, "is the very foundation of our edifice; this principle is the keystone of our arch; this principle is the corner-stone of our temple; this principle will prove the crown of our glory, because it is the crown of our utility; this principle is the DISTINGUISHING CHARACTERISTIC of our College, and gives it, in point of *public utility*, precedence of Oxford and Cambridge, and any other university hitherto founded."

In the course of 1847-8, we read of meetings more or less enthusiastic, in various localities, having for their object the making known the objects of the College, and especially that of the examination of teachers. It would be unjust to the early directors of the College not to declare that this was, in their estimation, a matter of the highest importance. Over and over again did they maintain, in public meetings, in meetings of Council, and in the "Educational

Times," that the real desideratum in education was the teaching of the teacher,—that the function of the educator was not a merely accidental acquisition, but required experience gained under qualified superintendence, together with adequate knowledge and a spirit of earnest devotion to its work. With teachers thus trained, education would assume a new aspect. It would be no longer a spiritless and futile drudgery, a heart-sickening work both for teacher and pupil, too frequently ending in mutual disgust; but a noble art, acting not only on the present child, the actual pupil, for present purposes, but fitting him, in his turn, to re-act on society, and to be himself an agent in the great work of human civilisation. Is this a task for the ignorant, the nonchalant, the low minded, the mere trader in education? Is it not one rather to tax all the energies, and to elicit all the virtue and enthusiasm, of the noblest of the race? And if we can find out and stimulate the powers of such men by our encouragement, shall we not, in so doing, elevate the profession of which they are members, and perform a valuable service to society in general? Such was the tone taken by the founders of the College of Preceptors,—a tone which has not been so clearly maintained in the years that have succeeded. In spite, however, of much bungling (this must be allowed) on the part of some of the officers of the institution,—in spite, too, of party feeling which intruded into the Council, and nearly broke the heart of the noble-minded Turrell,—the effect of the agitation caused even by opposition to the College, was good, and tended to enlighten the eyes and elevate the hearts of many who had despised the task to which they had devoted themselves. Well, thus, amidst smiles and frowns, the College went on developing its aims and taxing its resources; suggesting many schemes which came to nothing, but which promised to be useful,—such as an Assistant Masters' Association, which was to have the use of the College rooms, and discuss with Principals their common interests; the formation of an educational library, to aid the young student in Didactics; the publication also for his use of a "suggestive manual" on the Theory and Practice of Education, and also of a selection of the examination papers which had been given out to candidates in that department; the offering of prizes for eminent success in this and other departments, and also for essays on education; the publication, too, of "occasional papers" relating to school economics—fees, marks for lessons, organisation of studies, &c., for the benefit of principals; the publication of some of the admirable lectures which had been given to the members by such men as Dr. Reid, Dr. Latham, Dr. Pettigrew, A. J. Scott, Philip Kingsford, Rymer Jones, Garth Wilkinson, Arthur Henfrey, &c.; the projection of a course of twenty-five lectures directly on the art of teaching; and the distribution among the members of 200 copies monthly of the "Educational Times." These and many other schemes, involving a considerable expenditure, were actively discussed; while deputations to important towns, also involving much expense, made known with more or less ability—sometimes the latter—the aims and plans of the College. Many of these sources of expense were for a time checked, in order to procure at any cost what was considered the enormous advantage of the Charter. Some correspondence took place as to the right of the College to the word "Royal," which ended in its being finally disallowed by the Government. The expenses connected with the obtaining of the Charter pressed for a long time as a dead weight on the energies of the College. I insist the more on this and the other causes of expense just enmerated, because I consider that injustice has been done to those whose main fault, after all, was that, in their endeavour to carry out the original principles of the College, including the Charter, they in fact involved it in heavy pecuniary responsibilities. It is very well for us, who have adopted the conservative policy, pride ourselves on our money in the funds, and have spent scarcely anything of late years in extending the operations of the College, except in schemes which have more than paid their own expenses, to speak of the measures of those days with contempt. I acknowledge that there were at that time, encumbering rather than aiding the Institution, a few very inefficient officers, whose services it was a difficult and a delicate task to get rid of; but I say that, in spite of this severe disability, there was a power and an energy in those days which we have scarcely maintained since; and further, that the pecuniary straits of the College were mainly occasioned by the endeavour to accomplish objects—most of them worthy of praise—with insufficient means. It is a disgrace to be poor; and that disgrace the College long lay under.

At length the Royal Charter of Incorporation of the College of Preceptors was obtained, and public meetings and a dinner celebrated the occasion. What especial good it has done the College, beyond that of placing on record for all succeeding times the original aims of the founders, I am myself rather at a loss to conceive. Neither the number of members (at that time 1000), nor the number of teachers examined by the College, has been increased in the smallest degree by the possession of the Charter; and comparing the present year with the year 1849, I must remind you that we have in the year 1868 fewer members than we had then, and of teachers examined, 5 in 1868 against 16 in 1849. I must extract from the text of the Charter a few sentences to show what it pledged the College to consider as its primary objects. The preamble thus states those objects:—Certain persons, especially Henry Stein Turrell, and others, did associate themselves together "as an educational institution called 'The College of Preceptors,' for the purpose of promoting sound learning and of advancing the interests of education, more especially among the middle classes, by affording faculties to the teacher for the acquiring of a sound knowledge of his profession, and by providing for the periodical session of a competent body of examiners to ascertain and grant certificates of the acquirements and fitness for their office of persons engaged or desiring to be engaged in the education of youth, particularly in the private schools of England and Wales; and our said petitioner and others have subscribed and collected considerable sums of money for carrying out the purposes aforesaid, and are also desirous to provide a fund for the relief of distressed members of the said College of Preceptors and their widows and orphans." After laying down some general rules, the Charter ends in these words:—"And we do hereby will and declare that the surplus funds of the said corporation, after defraying the ordinary expenses thereof, shall be applied by the Council, but with the consent and by the direction of a general meeting in every particular case, in or towards the maintenance of poor or diseased members of the College, or of the widows or orphans of deceased members, or in or towards the founding or endowing of normal or training schools, or in instituting lectureships on any subject connected with the theory and practice of education, or in or towards founding branch institutions in connection with the said College hereby incorporated, or in any other manner calculated to advance the cause of education or in the interests of the scholastic profession, particularly within England and Wales."

The next important event in our history was the establishment of the Examination of Pupils by the College. Much controversy took place in the Council as to the propriety of diverting to boys that organisation which had been originally intended for men. Dr. Turrell, amongst others, from the most praiseworthy motives, strongly resisted the proposal. It was, however, at last carried; and looking back on the success which has attended it, both in relation to the College itself, whose funds have been augmented by it, and to the schools examined, it is a matter of much congratulation that it was adopted. There can be no doubt that this scheme long preceded that of the Oxford Local Examinations. It is on record that the first school examination by the College—that of certain pupils of Messrs. Goodacre and Cockayne, at Nottingham—took place at Christmas, 1850. The plan of examination was from time to time modified and improved, and in 1854 was in full operation—that is, four years before the Oxford scheme, and two years before that of the Society of Arts.

The time will not allow of any minute reports on the fortunes of the College in late years. Suffice it to say, that a vigorous effort on the part of some of its members for liquidating the debt which weighed upon it—the employment of an efficient in the place of an inefficient Secretary—the enlisting of several eminent schoolmasters of the upper ranks of the profession among its supporters, have delivered the College from the positive risk of destruction, with which, some few years ago, it was threatened. The College can now point with some pride to the nine thousand certificates it has awarded to successful candidates in the one hundred and twenty schools in union with it, as well as to the fact that its First Class Certificates are recognised by Her Majesty's Judges, and by the General Medical Council, as guarantees of good general education, and therefore as superseding the preliminary Literary Examinations of the Incorporated Law Society, and of the various Medical Corporations of the United Kingdom, as well as those of the Pharmaceutical Society; and to the fact that it periodically conducts the Preliminary Literary Examinations of the College of Surgeons. Hence the total number of persons at present examined annually by the College, including the 1,700 or 1,800 School Pupils, amounts to nearly 2,000—" a number which" (to quote the Prospectus) " greatly exceeds that of the Candidates who present themselves annually before any other Examining body especially concerned with the improvement of the education of the Middle Classes."

It will be unnecessary to discuss at any length the present operations of the College. You are aware, for the most part, of what they consist. But there is one feature to which I would devote a few moments' attention. It is that of the Monthly Meetings, one of which we are now holding. They were commenced on the 16th of June, 1861, by an introductory address from the Dean of the College. Many gentlemen interested in education, both literary and scientific, have from time to time delivered lectures, which had cost them more or less of labour to produce, to audiences composed of from sixteen down to three, or even two, Members of the College.[*] The repast was indeed prepared, but the guests were wanting—a circumstance which could hardly fail to make the entertainment occasionally rather flat, at least for the entertainer. His feeling, however, was, I believe, generally one of surprise that education should be a matter of such profound indifference to educators, that after a man, in some cases of considerable experience, had earnestly prepared himself to communicate what he had learned to his fellow-teachers, only three or four of them out of all London should care enough about the subject to go to hear him. Without wearying you with a complete list of those lectures, I will mention a few, in order to give an idea of their character, and, viewed in connection with the names of the lecturers, of their value:—Mr. Isbister has read a paper on "The Teaching of Euclid;" Dr. Pinches, on "Public Examinations;" Rev. W. T. Jones, on "The best means of Registering the Progress of Pupils;" Mr. Robson, on "The Teaching of the Classics;" Mr. Mason, on "The Teaching of English Grammar;" Mr. Nasmith, on "Teaching Chronology in connection with History;" Dr. Ernest Adams, on "The Teaching of English Composition;" Mr. Alexander Herschel, on "The Study of Astronomy;" Mr. Edward Hughes, on "The Study of Geography;" Rev. G. Henslow, on "Teaching Elementary Botany;" Mr. Melville Bell, on "Visible Speech;" Dr. Hodgson, on "Classical Instruction," on "Economics," and other subjects; Dr. Youmans, of New York, on "The Scientific Study of Human Nature;" Mr. Curtis on "The History and Analysis of Words;" Dr. Schaible, on "The Teaching of Modern Languages;" Dr. Buchheim, on "The History of Education;" Dr. White, on "The Apparatus of Education;" Mr. Morris, on "The English Language before Chaucer;" Mr. Wilson, of Rugby, on "The Introduction of Science into Schools;" Mr. Meiklejohn, on "Teaching English;" Mr. Oppler, on "Education among the Ancient Greeks and Romans," &c., &c.

It is not too much to say, that it would be difficult to match this list, imperfect as it is, considering the relation of the lecturers to their subjects. They are practical subjects, dealt with by able and practical men. They have not, however, received the honour which would have been theirs in any other quarter of the civilised world—the crowded attendance of teachers. In Germany, Switzerland, and the United States, there are Congresses of School

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[*] The above statement refers to "Members of the College—the audience has, with the addition of friends of the Members and incidental visitors, amounted on a few occasions to as many as thirty.

Teachers, the avowed object of which is mutual improvement in their common art, which are attended by three, four, or five hundred teachers at a time. A teacher, however, in England, that requires, or thinks he does, any teaching himself, is a phenomenon of rare occurrence; not unknown, certainly, but very rare.

In connection with the *present* of the College, I am bound, of course, to report the judgment given upon it by the Schools Inquiry Commissioners. This general judgment was founded on the facts and opinions cited by the sub-commissioners, especially by Messrs. Fearon, Bompas, and Fitch. Of these the first reported the estimate of the value of the College which prevails in and near London; and the last, that of the West Riding of Yorkshire. Mr. Bompas's district was Wales, and the counties of Hereford and Monmouth. Mr. Fearon found "the view to prevail that the College is now doing a really valuable work among secondary Schools, particularly those of the second grade." While, however, evidently disposed to think well of the College, he feels bound to add, that it is debarred from "undertaking the general control of secondary education in England by its want of prestige." "The College does not occupy," he adds, "and never has occupied, a position which would justify one in considering that it should venture to undertake the general control of secondary education." Mr. Bompas believes that "the College of Preceptors has not such a standing in public estimation as to make masters seek its certificates." Mr. Fitch does not think that in his district "the objects of the College had been fulfilled to any appreciable extent." "I find," he says, "among schoolmasters here, considerable distrust of the College of Preceptors." Several schoolmasters of good standing, who once supported it, "had withdrawn themselves in disgust at the shameless use which was made, in advertisements, of the letters M.R.C.P., by men who were wholly unqualified." The College, however, as Mr. Fitch acknowledges, can hardly be deemed responsible for such abuses, inasmuch as it professes to recognise as its proper "degrees" only the Associateship, the Licentiateship, and the Fellowship; "the only titles," to use Dr. Kennedy's words, "which imply either examination, or any recognition, on the part of the College, of ascertained professional competency."* It would, however, be unfair to suppress Mr. Fitch's evidence respecting the persons—five in all—whom he found in his district boasting of the distinction of Licentiate or Associate: one of whom was made an

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* Address at the General Meeting of the Members in July, 1862.

Associate because "he possessed a Goverment certificate;" a second, because "he had thrice sent pupils to be examined;" a third, for his "long standing in his profession," and so on. Mr. Fitch ends by saying, that in the whole county he had found only three men who had ever been examined by the College; and of these one had been examined by papers sent down to him, to which he had replied at home, sending them back after three days' interval. If these assertions of Mr. Fitch's are founded on fact, and not on misapprehension of some sort, we cannot wonder much at his summing up his report on the subject in the following words:—"On the whole, the excellent intentions of the College of Preceptors have been chiefly nugatory, as far as this district is concerned. It has no branch here, and I cannot find that it has ever held a meeting in Yorkshire, or that it has made the humblest attempt to unite the members of the profession into little associations for mutual counsel and help."* At the same time Mr. Fitch touches the real difficulty when he stigmatizes the remarkable lack of *esprit de corps* among schoolmasters generally, whose relations with each other seem to be much more governed by the law of repulsion than that of attraction. The Schools Inquiry Commissioners, in their general report, after quoting the above criticisms of their assistants, add in their own name the following remarks, which, it will be observed, while quietly rebuking self-complacency on the part of the College, do at the same time minister to its honest aspirations. "The College," they say, "may possibly win a higher position hereafter, and gain the confidence of the public. All that can be said at present is, that according to our reports that confidence has not been acquired as yet. And however good the examinations may be, they cannot be pronounced to satisfy the need."

I have not left much time for the *future* of the College. This department of the subject can, however, by no means be passed over. There are many energetic members of the Council at this moment earnestly employed in devising means by which the future may be made to retrieve some of the errors of the first. I think I interpret their wishes in expressing my own, that every effort that is possible should be made for extending the influence of the College in accordance with the spirit of the Charter. It is true that the early theory of our Institution has in process of time become somewhat obsolete, so that it is not so easy a thing as it once was to answer the question—*what is the object of the College of Preceptors?* An early councilman would have replied: "To carry out the spirit of the Charter, and therefore, above all things, to aim at obtaining better teachers—to direct the training for their profession, to examine them and certify to their qualifications—and, with a view to these objects, to found or endow normal schools, where they should study and practice the art of teaching under competent superintendence; to institute lectureships on the theory and practice of education, which they should attend; to found branch institutions as local representatives of the College and to advance in any other way the interests of education and educators." If a councilman of the present day is asked the same question, he must blush in giving his reply, that the main object of the College, as interpreted by its practice, is to examine the pupils of the schools in connection with it. The energetic members of Council to whom I have referred would by no means disparage the accomplishment of this object, which is perfectly legitimate, perfectly in accordance with the spirit of the Charter, but they think the College should claim a much higher position than that. The College, according to their views, being the oldest, as it is still the only corporate, body in England established for the advancement of the interests of education without regard to religious or political party, ought to be regarded as an authoritative embodiment of the interests and aspirations of practical educators, and of the theory of educators generally. Those interests it should so authoritatively represent (the authority being of course derived from the great body of teachers), that, in all Government movements respecting education, the College should be consulted; that its officers should advise respecting, and aid in, Government commissions on Education; that co-ordinately at least it should take part in Examinations appointed by the Government; and that its Examinations should be received on an equal footing with those of any other educated body whatever; that in order to increase its influence with the public it should, either *proprio Marte*, or by extrinsic aid, found lectureships and professorships in education, as well as found, endow, or utilise training schools. In short, it should, in every possible way, assert the principle that education is a *science* as well as an *art*—that there are degrees of accomplishment in this as well as in other arts —that it is of the highest importance to society, both at present and for the future, that this art should be encouraged and honoured, and that those who by natural gifts, acquired attainments, and long experience, have become masters of it, should be allowed to speak and act with authority upon it—that their authority, thus gained (and as represented by the College), should be allowed as against those who have not been similarly prepared, so that it should no longer be possible for Government Commissions on Education to be constituted without containing a single member—or only a single member—practically acquainted with the subject under investigation, nor for Government Inspectors of Schools to be gentlemen who, up to the day of their appointment, have had nothing whatever to do with teaching.

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* It appears from the Calendar of 1847 that at Beverley and Driffield there once were local boards with honorary secretaries.

If teachers of all ranks and conditions would from high and noble motives (not merely with a view to some personal and petty advantage to themselves) gather round the College, even now much might be done. Let them appreciate their profession at its proper worth, and believing themselves in its value to society, let each in his own person aim both to represent that professional worth for his own sake, and to make the machinery itself as perfect as possible for the sake of society. By this combination of special with general interests, education may be raised to the rank of a profession—a result greatly to be desired both for the sake of teachers and of society. The elevation of teachers in the social scale would be one of the best evidences of advancing civilisation. If, however, teachers desire the end, they must co-operate actively and sympathetically to obtain it. Without this co-operation, no college, however wisely constituted or energetically conducted, can act strongly on public opinion.

There are many means, into which I cannot enter now, by which educators might aid education in gaining a position of power and authority in this country, which at present it is without. Too many teachers, however—it no slander to say so—are so anxious about the near and the special, that they disregard the remote and the general. If they would reject the narrow theory which thus governs their action, and regard the interests of their profession as their own personal interests, that would in the long run more certainly secure the object of their ambition. They would find that a nobler theory than theirs would convert even theirs to its own purposes, and give them back the result with glorious usury. The man who aids a great institution with a view not merely to the good he can get from it, but to the good he can do to it, who looks with a generous eye on the interests of others as involving his own, and works magnanimously for that posterity which he will never see, will find, by a mysterious connection between events and consequences, that in devising liberal things he shall stand, and be supported by them—that in watering others he shall be watered himself.

Note.—In the discussion which followed the lecture, Mr. Freeman said he was one of those members who usually relied on the reports of the meetings which appeared in the "Educational Times;" but on this occasion he attended not only to hear the lecture, but from respect to the lecturer. The principal omission in the paper was the part which Mr. Payne himself had taken in establishing the College, of which he had been too modest to give any account whatever.

PROPOSAL

FOR THE

ENDOWMENT OF A PROFESSORSHIP

OF THE

SCIENCE AND ART OF EDUCATION,

IN CONNECTION WITH THE

COLLEGE OF PRECEPTORS.

(INCORPORATED BY ROYAL CHARTER.)

PROPOSAL FOR THE ENDOWMENT OF A PROFESSORSHIP OF THE SCIENCE AND ART OF EDUCATION, IN CONNECTION WITH THE COLLEGE OF PRECEPTORS.

A FEELING of dissatisfaction, long entertained, as to the results of our ordinary school instruction, has of late found expression through many channels. The Reports of Royal Commissions, Memorials of learned bodies to both Houses of Parliament, the published opinions of persons of authority, and the all but unanimous testimony of the daily press, concur in suggesting a grave doubt whether such results adequately represent any sound theory of Education. With this doubt has arisen a desireto im prove the quality of the teaching in schools, by making some provision for the better training of Teachers, especially those of Middle-Class Schools, for their profession.

This important object has long engaged the attention of the Council of the College of Preceptors. The College was authorised, by the Royal Charter it obtained in 1849, to apply its surplus funds towards "founding and endowing Normal or Training Schools, and establishing Lectureships on any subject connected with the Theory or Practice of Education." In default, however, of that general support from the whole body of Schoolmasters which would have enabled them fully to carry out these objects, they have never been in a position to do so from their own resources, which, being mainly derived from the contributions of a few earnest and public-spirited Teachers, are necessarily limited. While Parliament has been liberal, not to say lavish, in its expenditure of public money in promoting the training of Teachers for Primary Schools, and while the claims of our Universities, as well as those of Science, Literature, and Art, have been fully recognised by the Legislature, as is shown by the ample Parliamentary Grants annually voted for their support; the important class of Teachers engaged in our public and private schools, to whom so large a part of the higher education of the country is entrusted, have hitherto had no means provided for them by which they could obtain any professional training specially adapted to prepare them for their responsible duties. The Council of the College of Preceptors have repeatedly brought this grave defect in our educational system under the notice of the Government; and failing to obtain any aid or encouragement in their efforts to provide a remedy for it, they have endeavoured, by holding Meetings and Conferences of Teachers, to gain for their object the sympathy and support of the leading scholastic authorities, and of the general public. Finding themselves still unable single-handed to cope with the difficulties in their path, they suggested, in a Memorial to the Privy Council in 1872, that the Universities should take up the work, and by establishing Professorial Chairs of Education, follow the good example which has been set in Germany and elsewhere. No response having been given to this appeal, except in Scotland,* where the subject is now exciting much interest, they resolved at length to take up the matter themselves, and accordingly instituted a Professorship of Education—the first ever established in England. Considerable success has attended their experiment. During the years 1873 and 1874, nearly 140 students of both sexes have attended the Professor's Class, and derived great and acknowledged benefit from their attendance. It is easy to see, however, that such a Class cannot be self-supporting. The fees, unless very moderate, would exclude those whom it is especially sought to help; while, on the other hand, the College has no fund to fall back upon for supplementing the fees.

Having now carried on this important experiment for two years, the Council are anxious to obtain such aid from the public as will enable them permanently to endow a Chair of Education in connection with the College. They are the more encouraged to hope for this aid from the fact that the Class has been, and is, open to Teachers of all grades, whether connected with the College or not, without any sectarian or other restriction whatever. This liberal and catholic character they still resolve to maintain.

As the object they have in view is one which concerns not

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* It is gratifying to be able to state that, since the above was written, the Government authorities have responded to an appeal made to them by the Trustees of Dr. Bell's Fund, and the Senate of the University of Edinburgh, for help to establish a Professorship of Education, by granting a sum of £10,000 towards the endowment of two Professorships—one at the University of Edinburgh, and the other at that of St. Andrews. The significance of this event, which amounts to an authoritative recognition of Education, both as a Science and as an Art, is sufficiently obvious.

Teachers only, but all classes of the community, they appeal with confidence—(1) to the General Public, who are interested in having their children taught on rational principles; (2) to the Friends of Education, who have long complained of the unsatisfactory results of the present system, or want of system; (3) to Principals of Schools, both of boys and girls, who find an increasing difficulty in meeting with Teachers who know how to teach; and (4) to Teachers of all kinds, who desire to see the standard of education advanced, and their noble profession protected against the intrusion of ignorant and incapable pretenders.

The Council believe that a very moderate endowment would enable them to carry out their object. The interest of the endowment, with the addition of the fees charged to the students, would probably suffice to engage the services of a Professor qualified by experience in the Art, and knowledge of the Science, of Education, and moreover thoroughly acquainted with the history of Education, and the methods of the most eminent masters of teaching, past and present, in England and elsewhere. The lectures, lessons, and training of such a man, enforced by genuine enthusiasm for his subject, would, by inspiring young Teachers with a respect for their profession, and correcting erroneous impressions as to the objects to be aimed at in pursuing it, greatly promote the cause of Education.

The Council are fully aware that the establishment of a Professorship of Education does not alone accomplish all, or nearly all, that is necessary for the equipment of the Teacher. They therefore have in view, should they meet with sufficient encouragement, the founding of a Training College, with Model and Practising Schools for exemplifying the best methods of teaching, the enlargement of their present Educational Library, and the addition of an Educational Museum and Reading Room for students.

As the matter itself is of the deepest importance to the interests of the whole community, and as the need for dealing with it is urgent, the Council earnestly hope that this public appeal will not be made in vain.

A

COMPENDIOUS EXPOSITION

OF THE

PRINCIPLES AND PRACTICE

OF

PROFESSOR JACOTOT'S

CELEBRATED

SYSTEM OF EDUCATION,

*Originally established at the University of Louvain, in the
Kingdom of the Netherlands.*

BY JOSEPH PAYNE.

"Already are Schools, after the method of Jacotot, spread over France and the Netherlands,—already does almost every town and province in the north of these countries possess either an establishment upon the principle, or one or more instructors."—*Foreign Quarterly Review*, February, 1880.

"M. Jacotot a rendu un service inappréciable à l'humanité. La méthode de M. Jacotot repose sur des principes aussi certains que féconds en heureux résultats."—*De la Méthode Jacotot, par M. Rey de Grenoble.*

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1830.

PREFACE.

A FEW particulars respecting the origin and progress of Jacotot's System of Education, may, perhaps, form an appropriate Introduction to this little Treatise. M. Jacotot, a native of Dijon, became, in the year 1818, Professor of the French Language at the University of Louvain, and there established the celebrated system, which, from its principle of unlimited applicability, he has denominated "Universal Instruction." He here, in the course of his professional duties, accidentally made the important discovery, for which he more especially claims the merit of originality,—that *it is not necessary to explain in order to teach*, or in other words, that *the pupil may be made to discover for himself everything requisite to be known*. Called upon to teach the French language, while unacquainted with the native tongue of his pupils, he put into the hands of the latter Fenelon's Télémaque, with a Dutch translation, directing them (through an interpreter) to commit to memory the French text, and to gather the meaning from the version which accompanied it. These pupils having thoroughly learned half of the first book, were made to repeat incessantly what they knew, and to read over the remainder attentively, so as to be able to relate the substance of it. Their thorough acquaintance with both the subject and the phraseology was ascertained by rigid interrogation, and they were then directed to write compositions in French, deriving all the necessary materials from their model-book. Their success in this exercise surprised even the Professor himself; and on considering the circumstances, he was led to observe that all the results had been attained without explanation on his part. He instantly resolved to ascertain to how great an extent this principle might be applied, and to *tell* his pupils nothing whatever. He found that, as they became more and more acquainted, by repetition, with the twenty-four books of Télémaque, they spontaneously observed in their compositions, every rule both of orthography and grammar, until at length they showed themselves capable of writing (with regard to style) as well as the best French authors, and consequently better (as Jacotot said) than himself and his professional colleagues. The complete success of this experiment led to the institution of others, in which the spirit of the principle was carefully preserved, and the entire process and ultimate results accurately scrutinized. The principle that explanations are unnecessary, was discovered to be not merely general but universal; and it was further observed, that the method founded upon this principle is actually the method by which we acquire everything that we learn without the aid of an instructor. The perception of this identity tended to confirm and harmonize the notions already springing up in the mind of Jacotot, and laid the foundation of the System.

An allusion to its progress is seen in the motto to this pamphlet, and in the present instance this must suffice. To trace its history through the many controversies of which it has been the subject, might be interesting, but is here impracticable. It may easily be imagined, that the Universal Instruction has some claims to attention, when it is stated that "the sale of M. Jacotot's own publications is immense, and the number of explicatory pamphlets in the French language, published in France and other places, almost incredible."* It is at length beginning to excite an interest in England, and already many eminent private teachers have adopted the method with unquestionable success. A Guide to French, in conformity with its principles, has just been announced by M. Tarver, teacher of French at Eton College; and M. Henri, one of the most zealous of Jacotot's disciples, now residing at Boulogne, is expected shortly to introduce the system, in a practical shape, to the British public.

In the meanwhile, the writer of the present Treatise has attempted to unfold the general principles and method in the following pages, to which he respectfully invites the attention of all who feel an interest in the important science of education. It is believed that the system of Jacotot alone deserves the name of a *System* of Education. If its individual principles are not novel, the united whole is at least a novelty;—the wonderful results which it has effected are novelties. It embraces the advantages, without the blemishes, of other systems; and presents, in harmonious combination, all those elements that have ever been deemed, by common consent, valuable and effective in practical tuition. It is, in short, a κτῆμα ἐς ἀεί,—a possession for ever; and the writer of the following pages feels that his humble name derives an unanticipated degree of honour, from its being that of the first Englishman who has publicly expressed his thorough conviction of the validity of the principles and efficacy of the method of the Universal Instruction.

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* "Foreign Quarterly Review," February, 1830. This number contains a sensible exposition of the system, scarcely, however, doing justice to its characteristic merits.

3, Rodney Buildings,
New Kent Road.

PRINCIPLES AND PRACTICE

OF THE

NEW SYSTEM OF EDUCATION.

LEARN SOMETHING THOROUGHLY, AND REFER EVERYTHING ELSE TO IT.

THE above sentence comprises the entire method of the Universal Instruction. Whenever this precept is neglected, the constitutional character of the system is disregarded, and the success of the teacher's endeavours is no longer guaranteed by M. Jacotot. The spirit of it so completely pervades every part of the machinery of the method, that the one cannot, by any means, be separated from the other. As, however, the terms in which it is expressed may not intuitively convey the requisite notions to the mind of the reader, an attempt will be made to develop more fully their strict signification, as connected with the system of Jacotot. Their real import here is, that whatever department of education be in question, something,—some particular fact, or group of facts,—shall be thoroughly impressed on the memory and comprehended by the judgment; and that this individual fact, or group of facts, shall serve as a kind of rallying point, around which all other facts, subsequently acquired, shall be made to attach themselves, according to their resemblances and inherent relations. The habit thus formed of referring, by reflection, everything learned for the first time to something previously learned, tends, of course, to connect the entire mass together; and in this is seen the superiority, as well as the peculiarity, of Jacotot's System of Education. This system is indeed entirely conformable to the laws of Nature, and the generally received opinions of common sense. He only can be said to understand a subject thoroughly, who distinctly perceives the relation of every part of it to every other part, and who clearly traces the entire series of associated ideas which make up the whole, from the beginning to the end, or back from the end to the beginning. But who can do this? All, indubitably, who are instructed by the method of Jacotot; for this method leads uniformly and invariably to that end. Will not every one then agree, that the system which can accomplish so important a design is undeniably superior to all others that have hitherto been projected?—Without doubt, if it can be done.—But it has been done, and repeatedly, and the reader will presently judge for himself, whether the process followed is likely to effect its purpose.

It may not be amiss to consider, in the first instance, what is generally meant by the expression,—*learning a thing*. To learn anything is evidently not the same as to forget it; yet we might almost imagine it were, by referring a moment to the common plan pursued in the old method. Will any one maintain that, speaking generally, at the end of his seven years or more of school instruction, he actually recollects one thousandth part of the facts that have been brought before him, or the observations that have been addressed to him, connected with the course of tuition? A considerable portion of all this combined mass of information has remained perfectly unintelligible to him, from the first moment that it was introduced to his notice, to the time at which he throws down his books and enters on the world. He perceived neither the end nor the design of it; and perhaps even the terms in which it was expressed were never thoroughly comprehended, although repeated incessantly in his hearing. In illustration of this it may be asked, Does one child in a hundred *understand* a single page of that book which is put into his hands as soon as he can read, and over which he pores, year after year, and, at length, by dint of constant repetition, has thoroughly impressed on his memory—the English Grammar? This may well be doubted. He learns, indeed, what is to him a jargon of unintelligible technicalities, like nothing that he meets with in the conversation of his comrades and friends, or in the language of those juvenile volumes, which a nascent taste for reading may induce him to peruse: and after all, he is at a loss to conceive of what use it is for him then to know, that a verb is a word which signifies to be, to do, or to suffer; or that there are two kinds of conjunctions, the copulative and the disjunctive. It would be absurd to ask him if he thoroughly understands these words, for it is quite impossible, even if the individual terms be explained to him; if, for instance, he perceives tolerably well what is meant by the words, conjunction, copulative and disjunctive, how can any idea be received into his mind, of a something which separates while it joins: and even supposing the present difficulty surmounted, does not the question incessantly recur to him, What is the use of all this? You tell him he cannot speak properly unless he understands grammar; but he does not, he cannot, perceive why it should be so; and perhaps he wonders how it is that he contrives to utter a correct sentence without recollecting, at the moment of utterance, all the grammatical rules which have been so constantly urged upon his attention. He however infers, that he does very often speak correctly, because he uses the same expressions as everybody else; and the point of mystery is, that he chances to do so without remembering the rules of grammar. The same remarks will apply, more or less, to many others of the generalities which, in the common course of instruction, a pupil is called upon to learn, but which he cannot, from a want of the information previously requisite, understand. Even, however, supposing that he does actually acquire a number of really useful facts, they form in his mind an *indigesta moles*, a shapeless mass, in which he perceives neither order nor connection. He has not been taught by the method of Jacotot, to refer everything learned for the first time to something previously learned; and he cannot, therefore, perceive the relation which the latter bears to the former. But there must necessarily exist a relation. Unless the parts of the book committed to memory had been connected with each other, in the mind of the author, he would of course have produced a disorderly patchwork of incoherent facts. But this is not the case, at least in any approved work; and if this be not the case, if it was necessary for the author to see clearly the end and aim of all that he proposed to write in order to convey a connected idea of the subject to the reader, it must be equally necessary for the reader, if he wishes to understand the subject as well as the author, to gain possession of the entire series of facts, which compose the subject, as presented to his view. This, however, cannot be done, unless the pupil is taught to connect what he learns one day with all that he has learned, relating to the same subject, on every previous day, from the time when it was first urged on his attention. But the facts forgotten cannot, of course, be connected with those remembered; though it is easily seen, that were these supplied, the whole subject would be before the mind. This leads again to the remark previously made, that scarcely a thousandth part of what is learned (using the word in its conventional sense) at school, is retained for use in the actual business of life; though this, most evidently, was the ostensible purpose throughout the entire course.

If the considerations here adduced be thought to have any weight, they must evince one of two things,—either the positive incapacity of pupils of the usual scholastic age to comprehend any subject in the manner referred to, or the defectiveness of the customary method of tuition. It would be impossible, in the face of countless instances in opposition, to maintain the former assertion. If a child can be made to commit to memory, and understand one sentence, for instance, there seems no physical obstacle to his doing the same with another, still retaining the first in his memory by constant repetition, and thus connecting the new fact with all that preceded it. This is the method of Jacotot, and he has proved incontestably both the possibility and the effectiveness of such a process. He indeed asserts, that *the youngest child can comprehend thoroughly the terms representing the most complex abstract notions*, that is, if he previously well understands all the simple subordinate notions contained in those that are complex. Whether such attainments as these here referred to be within the reach of any child, even the youngest, is only doubted by those who have never attempted to satisfy themselves by actual experiment. The probability of success, at least, will be presently shown. While a pupil, by any particular method, can be taught to acquire more than he would have done by another given method, it is absurd to tax the incapacity of the pupil for that which is decidedly the fault of the plan of tuition pursued. The general question, however, to which this remark would lead, as to the actual fitness of the particular systems of Education now in use, to the real purposes for which instruction is needful and valuable, will not here be investigated. Two or three facts, from which the inferences requisite to the view now intended, may be drawn, are sufficiently obvious to the personal experience of all. After sedulously going through all the manœuvres of instruction, for several years, we come from school to begin our education afresh, according to the particular objects which it may be desirable for us to attain in life. We are in possession, indeed, of a vast number of facts, but they lie for the most part unconnectedly and incoherently in the mind. Of a number of others we have a loose and vague notion, just sufficient to admit of consciousness that they exist, and have names attached to them, which names we know well, without knowing the things themselves. Still less, however, in these latter fragments of knowledge than in the former, do we perceive any sort of coherency or natural connection: and upon a review of the whole of our acquirements, during the long time that we have been employed in making them, the feeling which takes full possession of our mind is,—that nine-tenths of all that we learned has been forgotten;—that we are well acquainted with no one subject whatever;—and that in nearly every point which most concerns us we are—

> Unpractis'd, unprepar'd, and still to seek.

But by the system of Jacotot, the faculties of the mind are kept in constant action, from the commencement to the end of the course of instruction; the first acquisitions, as well as all that succeed, are permanently retained, and accordingly everything learned once is learned for ever. This is a most essential point secured; for the time and labour spent upon the acquirement of that which is not retained, must be considered as utterly lost. He is not rich who has had a large fortune, but he who is still in possession of it, and who can avail himself, at his pleasure, of the advantages which it furnishes. Hence, says Jacotot, "*We are not learned merely because we have been taught, we are learned only when we have retained.*" A thorough *helluo librorum* may, like Magliabecchi, devour six large roomsful of books, and yet leave it on record, as he did, that the reader of a vast quantity knows but little of what he reads. One single book, thoroughly understood and impressed on the memory, is of more service to the mind than fifty hastily skimmed over, and forgotten even sooner than read. And in the application and modification of this principle consists the entire method of Jacotot. "But there is nothing new in this plan," some will remark; "it has often been acted on before."—This is not questioned for a moment. It has often been acted on before, and, as our author remarks, no man ever became great without adopting and pursuing it. No one ever attained a complete and profound knowledge of any subject but by means of the principle now first proposed for adoption in the elementary stages of education. Whatever we wish to learn, whatever it becomes absolutely necessary for us to learn, we acquire by this method, and by no other. We cannot even understand what we read without it. How can we be entertained by the perusal of a simple tale or novel, unless we comprehend all the circumstances, as they rise before us, and refer those which appear for the first time to those which have already come under our view? He who retains in his memory the greater number of these circumstances, will, if the work be well executed, receive far greater pleasure from the perusal, than he who forgets most of them, as he turns over the pages in which they are contained. The one will perceive beauties which are to the other perfectly invisible; the former will comprehend the force of numerous allusions and acute witticisms, which are to the latter quite unintelligible. The proviso has been made, *if* the work be well executed; for it is evidently a supposable case, that the reader may examine more closely the several parts of the work, their fitness to each other, and harmonious combination in forming the whole, than did even the author himself during the composition of it. Many a work which has obtained a fair reputation could ill bear this scrutiny. Many an author is indebted to the careless memory of his readers for the facility with which his own faults escape undetected. A truly great work, however, can be submitted to this sort of examination. We here observe, that every word, sentence, and circumstance, has its own duty to perform, and is placed in that order of situation which shall most conduce to the perfection of each part, and the perfect harmony and unity of the whole. Now we cannot thoroughly enter into the spirit of an author, but by tracing his design throughout all that he presents to us;—from an investigation of the minute component particulars we obtain general notions, and by comparing these amongst themselves, we obtain others still more general, till at length, by this analytical process, we arrive at the very point from which his mind first started, and look back upon the whole in the same way, and with the same train of feelings, as those with which he prospectively surveyed it. Hence it is seen, that though the route which we traverse is in a precisely contrary direction to that along which the author passed,—the one being analytical and the other synthetical,—yet that in the course of it, we must necessarily pass through all the associated ideas, with the variety of feelings and sentiments excited by them, which linked and developed themselves in the mind of the writer who gave them expression. It follows from this, that if it be necessary for him to employ every word and phrase that he does employ, in order to convey to us the ideas or sentiments which he himself perceived and felt, it must be equally necessary for us to notice and comprehend each individual word and expression, that we may trace on the tablet of our own mind an exact copy, both in design and colouring, of that picture which he has presented to our view. Now if he used more words than were necessary—if, again, any of these failed to transfer the idea which he had pictured, to our mind—so far is his performance faulty; and it is not on this account that he is considered a fine or correct writer. Inasmuch, however, as he avoids the commission of these faults, so does he approach towards positive perfection, and attain the envied reputation of a truly great author.

"But," it may be said, "what have all these critical observations to do with the system of Jacotot? Children cannot criticise individual words and expressions, and perceive the design, or detect the faults and beauties, of an admired literary composition." To this it is answered, that M. Jacotot has imagined, or to speak correctly, has *proved* beyond a doubt, that little girls and boys, of between the ages of ten and fourteen, can do everything here enumerated, not only with the classical authors of their own language, but with those of any foreign language (living or dead) which they may be studying;—and the observations referred to embrace in part the method of the system. The pupil of the Universal Instruction is taught to believe that every word used by a good writer modifies in some respect the idea intended to be conveyed, and that, therefore, to understand the whole, he must understand each individual part; and he is never said to have learned a thing which he does not thoroughly comprehend (that is, receive altogether) in his mind, by an accurate perception of every subordinate notion, and of all its relations with what he has previously learned. The knowledge thus gained is not likely to escape quickly from the mind; and the practice of incessant repetition, which is the soul of the system, renders permanent the first and all intervening ideas received by the understanding; so that of the mass of information, ever rolling on, and becoming augmented by contributions from all sides, may be justly said—

Vires acquirit eundo.

But it may be well to enter more particularly into the details of the method pursued, that the fitness of the means to attain the end predicted in the foregoing observations may be at once perceived.

READING AND WRITING.

Instead of spending some few years in the acquisition of these very useful elementary arts, as is generally the case by the common method, the pupils of Jacotot learn to read and write in about a fortnight!—at the termination of which period they are deemed capable of beginning the study of the vernacular language, according to the method which will shortly be explained. In perfect consistency with the harmony and unity of design, which pervades the entire system, the little pupil is taught to acquire, at the very commencement of his studies, those mental habits which are the grand means of success in his advancement throughout the entire course. He is at once taught to LEARN SOMETHING THOROUGHLY, AND TO REFER EVERYTHING ELSE TO IT; and, consequently, begins to notice resemblances and differences, to exercise his judgment, to analyse, to generalise, and, in short, to bring into play nearly the whole of his intellectual faculties. To attain these advantages, all the customary helps of alphabets, primers, spelling-books, first readings, &c., &c., are neglected, and some standard classical work (generally that which is to be his chief guide afterwards in the acquisition of the language) is put into the hands of the pupil. In answer to anticipated objections, it may be here stated, that the young student is not expected, at this stage of his progress, to understand what he is taught to read. It is, however, highly probable that his ideas will be quite as clear and definite upon the subject, whatever it may be, as those which he would have obtained by poring over the cabalistical syllables, ba, be, bi, bo, bu, cat, lat, tat, &c., &c., in all their array of conceivable combinations.

The work selected for the initiation of the pupil, and for purposes hereafter to be mentioned, must, of course, depend upon the will of the master. In the present instance, merely for convenience, reference will be continually made to the English translation of Telemachus, since Fenelon's elegant fiction is the work chosen by M. Jacotot as the standard or model-book of his French pupils, while acquiring the knowledge of their own language.

Supposing, then, that Dr. Hawkesworth's Translation of Telemachus were the work selected (though, of course, no English teacher would adopt this as a model of English composition), the attention of the pupil is at once directed by the master to the opening sentence of the first book, which runs as follows—

"The grief of Calypso for the departure of Ulysses would admit of no comfort."

Pointing to the word "The," the master pronounces it in a very distinct tone, and directs the pupil to repeat it after him. He then recommences with the first word and adds the second, and the two words are repeated in succession by the pupil. Beginning again, the third word is added, and the three are repeated by the child accordingly. The same process is used with the fourth word, still recommencing with the first. A pause is now made, and the pupil is at once called upon to exercise his faculty of noticing resemblances and differences. He is asked to point out the respective situations of the word "Calypso," "grief," "of," "the;" the interrogation, after this manner, being continued till he can show, without the slightest hesitation, the place of each. He thus learns to distinguish them from one other. Any page of the book is then opened, and some particular sentence or line being pointed out to him, he is asked if the words that he knows are to be found there. If he is thoroughly acquainted with the forms of them by the previous interrogation, he will have no great difficulty in perceiving those of the same form, in whatever part of the book they may be. As soon as the master is assured that the child is in thorough possession of these four words, he goes on adding successively the remaining words of the sentence, always recommencing with the first. If the child becomes well acquainted with the word "of" when first met with, he is, of course, expected to recognise it twice afterwards in this sentence. The process of interrogation pursued at the end of the first four words is now repeated with each word of the sentence, until the child learns accurately to distinguish those words which are different, to recognise the likeness between those which are similar, and to point out any word of this sentence in any page of the book that may be opened before him. Proceeding according to strict analysis, the master now recommences the examination of each word of the sentence, dividing every word of more than one syllable into its component syllables, thus—"The grief of Ca-lyp-so for the de-par-ture," &c. The pupil is then called upon to notice and distinguish each syllable, after the same plan as that pursued with respect to entire words, and, at length, he is made acquainted with the name of every letter. After he has been well exercised, in this manner, upon a few sentences, the teacher directs him to go on by himself, without previously pronouncing the words to him, and only assists him when he meets with a word, syllable, or letter, which has never before come under his notice. Still, however, he *must recommence with the first word learned*, as it is by this means only that all his previous acquisitions are permanently retained. He soon begins to have the first three or four sentences, thus so frequently repeated, impressed on his memory, and is told to spell them, dividing them into their component syllables and letters, from recollection. After about sixty lines have been thus gone through, he cannot fail to be acquainted with nearly all, if not all, the letters of the alphabet, and with a vast variety of their combinations. It is, indeed, considered, that he is now taught to read. . If any hesitation, indicative of imperfect perception, is evident in the pupil, the master must return to the same words, syllables, or letters, until they are thoroughly distinguished and comprehended. By this means, every new acquisition becomes permanent, and every effort brings with it the proof of some progress. Hence, as has been before remarked generally, there is no lost labour. If the pupil should only learn one word in an hour, yet is that word for ever learned, and indelibly stamped on the memory by the *incessant repetition of the first thing required*, which is the very life of the system. The pupil is never to be assisted, except in what is introduced to his notice for the first time. That which he has already learned, he is expected to recognise wherever he may meet with it. It is he, and not the master, who is to make remarks, and discover relations of difference and similarity. The master asks a great number of questions, and causes the pupil, whenever a wrong answer is given, to discover for himself the error into which he has fallen. To do this, he must reflect, he must make comparisons, and, however young he may be, these operations of the mind are certainly within his reach, and nothing but a want of attention can prevent him from performing them successfully. The moment an infant opens its eyes to the light in this world it begins to make comparisons; that is, to discover resemblances and differences. We can imagine no period in its infantile existence, supposing it to be born in the possession of the corporal senses of humanity, in which it perceives not a distinction between light and darkness, hot and cold, or in which it cannot recognise its nurse from a total stranger. No one, then, can perhaps be found, who will maintain the incapacity of any child that can speak, for the performance of everything required in the process just described, if only its attention can be gained.

With respect to the motives to be applied, in order to make the pupil attentive, these must be left to the discretion and judgment of the instructor. One means, however, derived from the operation of the system itself, will be found very efficacious, and it is so much the more to be relied on, as it is in unison with the pupil's own feelings. This is, the success of which the child is conscious as the result of his own efforts. However young and thoughtless he may be, a degree of pleasure to himself will always attend the consideration that he has accomplished his object. He is not allowed to say, he cannot do what he is told to do, for he soon finds that if he will try, he can overcome what at first he may have considered an insuperable difficulty. And if he once succeeds, why not again? and why not always? These questions may not indeed suggest themselves to him spontaneously; it is not to be expected, nor even desired, that he should lose the feelings of a child, and prematurely assume those of a more advanced stage of life: but whenever even the most unpromising pupil is made conscious that he has done well, by paying attention, and that he therefore knows something, his mind is then in a fit state for receiving such injunctions as may gradually, by their constant repetition at seasonable opportunities, induce those mental habits which will subsequently be of the most important service to him in the acquirement of knowledge.

If the foregoing directions have been understood, a tolerably correct notion will be obtained of Jacotot's method of instruction, as regards the art of Reading. It may be observed, that the object of the process described, is simply to make the pupil acquainted with the forms of words, syllables, and letters. What may be called declamatory reading, is reserved for a more advanced stage of his progress, and the general rule given for the attainment of it, is, *Read as you would speak.* This direction has often been given before the time of Jacotot, but it is rare to find instances of its being implicitly and constantly obeyed by pupils at school. Unless the sentences read are understood, they cannot, of course, be felt; and to expect a child to read that which he understands not, and feels not, with the same degree of emphasis and propriety of tone as are dictated to him by Nature in his own spontaneous expression, is to indulge a hope which cannot, by any possibility, be gratified. But the Universal Instruction, as will be presently seen, ensures the thorough comprehension of every idea presented to the pupil's notice, and he is, therefore, so far prepared to read as he would speak.

After the child has received two lessons in reading, he is made to begin to write. And here, again, the process employed is very different from that in common use. Instead of commencing with elementary lines, curves, and letters, in what is called text-hand, a complete sentence, written by the master, or engraved in *small-hand*, is put before his eyes, which he is directed to copy. For obvious reasons, this sentence is generally the same as that from which he received his first notions of reading. The two pursuits are thus made mutually to assist each other, and the pupil very soon learns, by himself, to distinguish between the printed characters and those employed in writing. He writes, as well as he can, the first word "The," and no further progress must be made, till, by an attentive comparison of his own performance with the original copy, he becomes conscious of the faults and defects of the former. But in exciting this consciousness, *it is not necessary for the instructor to make the slightest remark; the pupil himself discovers all the faults, and suggests the proper remedies.* The teacher does nothing but ask such questions as may cause the pupil to direct his attention to the subject, and induce him to see that the means of success are entirely within his own power. Some teachers may perhaps be inclined to doubt whether a very young child can observe and particularize by itself every deviation from the standard prototype which is proposed for imitation. The best way of settling such doubts is to make the trial. This will prove that every child can point out its own errors as well as the instructor himself; and the actual advantages gained in the respective cases admit of no comparison. The pupil who is constantly *told* of his errors, listens, for the most part, to all that is said on the subject, either with vacant indifference, or with that sort of feeling which relies rather on the present indulgence of idleness, than on the future rewards of attention. But a feeling of conscious shame is induced in the mind of the child, who perceives from the answers which he cannot fail to give to the questions propounded, that he is perfectly aware both of the faults of his own performance, and of the proper remedies to be applied in subsequent attempts. The appeal —You see you know what is right, be careful then to practise it,—is often of considerable service in exciting attention, when other means would probably fail.

The questions referred to as necessary to be put to the pupil are of a similar character and tendency to the following:—Pointing to the first letter of the pupil's attempt, and directing him to look carefully both at it and at the copy, the teacher says,—

Q. Is this 𝒯 well made?

A. No; it is too high, or too short, or too long, &c.

Q. Could it be made better?

A. I think so.

Q. What must you do then to improve it?

A. Make it longer, or shorter, or broader, &c.

Q. How could you have made it better at first?

A. By paying more attention.

These questions, it is easily seen, may be indefinitely varied and extended, according to circumstances, but the principle must never be lost sight of, that *the pupil always corrects himself.* Each letter passes under a similar review, and the whole word is then written over again, the second and each successive attempt being subjected to the same rigid investigation until the pupil learns to correct, in a greater or less degree, every fault, as previously particularised by himself. He then goes on to the second word, in examining which, the process just described is invariably employed, and so on with regard to the rest of the sentence, recollecting, that every time a fresh word is taken, the writing must commence with the first word written, that all the results of the attention previously bestowed may be embraced and preserved each time of transcription, and that the pupil may not fall again into any of the errors of which he has already been made conscious. When the child begins to transcribe a sentence or two tolerably well, he is required to write from memory, and afterwards note his faults by comparison with the original copy. After some considerable practice in the writing of small-hand, he is carried forward to exercises in the bolder styles of writing, while, at the same time, the incessant maintenance of the principles originally urged upon him, is, on no account, to be looked upon as a matter of slight importance. *He can never perform anything so well, but that with more pains he may perform it better.*

LANGUAGES.

As soon as the pupil has obtained, by the process already described, a tolerable acquaintance with the elementary arts of Reading and Writing, his future progress in them is made to connect itself with the study of his own language, to which he is now, in course, directed. It is not, however, designed that he shall cease to give them the same attention as before, but that they shall now be applied to some actual service. He shall be taught to see and prove for himself the useful purposes to which they can be made subservient. An object will thus be apparent to his view, and labour, with an object, is much more cheerfully performed, even by an idler, than that which seems to be exacted arbitrarily, and the end and aim of which are but indistinctly discerned.

M. Jacotot's method of teaching languages, considered as a whole, is so different from all previously pursued, that it is easy to account for the repugnance which many intelligent instructors have evinced, to put the efficacy of it to proof by actual experiment. They have found themselves unable to comprehend, at a glance the connection between means and end, and have at once decided that the alleged results are incredible, and the method wholly incompetent. But this is a mere assertion, opposed both by undeniable facts, and by the plausibility of the scheme itself, which, indeed, they would have at once acknowledged, if it had received, as it ought to have done, their serious unprejudiced consideration. It is, however, hardly to be expected, that any one, unless the positive results were incessantly under his eyes, should heartily adopt the method, before he had, in some degree, satisfied himself with the arguments which serve to establish its theoretical excellence. Were this not the case, one single page would be sufficient to give the teacher all the necessary directions, since, as before said, the practical part of the system is embraced in the words, LEARN SOMETHING THOROUGHLY, AND REFER EVERYTHING ELSE TO IT. The principle comprehended in these terms is modified or varied to suit different circumstances, but it still remains essentially the same. To adapt it to the study of all languages, whether the vernacular or others, it is made to assume the following form:—*Learn one book in the language (whatever this may be) thoroughly, refer all the rest to it by your own reflection, and verify the observations of others by what you know yourself.* He who obeys this direction acquires languages in about one-tenth of the time usually employed to arrive at the same result. It will be observed, that nothing is there said of learning grammar, writing exercises upon it, &c. Grammar, instead of being introduced to the pupil's attention as soon as he can read, is postponed to a very late stage in his literary education. He writes themes, moral and metaphysical essays, criticisms, &c., &c., and, in short, goes through an entire course of elementary composition, before he is required to investigate the principles of grammar. This must necessarily surprise those who are accustomed to believe that an acquaintance with the rules of grammar is a pre-requisite to correct composition in every language. This assumption, although very generally prevalent, cannot be supported by any arguments whatever. As far as the vernacular tongue is concerned, it is opposed by innumerable facts, which will occur to the mind of every attentive observer. Many persons write with perfect correctness without being able to account grammatically for a single sentence, or even a word, in their composition. Many more speak grammatically, although utterly unacquainted with grammar. But how could this happen, if a knowledge of that science were indeed so essential to accuracy of language, as it is assumed to be? Again, every one concerned in tuition is aware.

that a child may be able to repeat the grammar from one end to the other, and yet be totally incapable of putting three correct sentences together. It is, therefore, evident that the science of grammar, and propriety of composition in the language, are not quite so intimately connected as some may imagine. No one will indeed deny that a perfect acquaintance with all the grammatical rules of a language would effectually prevent the commission of errors, if the person thus gifted should recollect, every time he spoke or wrote, the exact rule necessary to be observed in the construction of his sentences. But no one who speaks or writes well does this. He who is accustomed to tremble at the thought of committing a grammatical solecism, or who imagines that his thoughts can be at all strengthened or adorned by a scrupulous anxiety of this kind, will never thoroughly succeed in composition. His style must, of necessity, be stiff and constrained. Did Milton or Shakespeare stay, before they penned their immortal lines, to consider if the expressions they employed were precisely grammatical? No;—the thought was entire, and they were well acquainted with the conventional signs in which it was to be conveyed, and they wrote what will last for ever; but they did not effect this by a superior acquaintance with the technicalities of grammar;—many a school-boy would, probably, have been more than a match for them both in this respect. The immediate inference from the foregoing considerations is that the real importance of grammatical knowledge, in the business of education, is by no means commensurate with that factitious estimation in which it has long been held. The pupil is taught to consider that he is learning his own language, when he is, in fact, only becoming acquainted with the general observations that have been made upon it. Grammar is a science of generalities, entirely derived from the actual state, the facts, indeed, of the language. The language must indisputably have preceded all the grammatical rules founded upon it. Instead, therefore, of learning rules, in order to apply facts to them, the pupils of Jacotot are directed to learn the facts themselves, and afterwards to verify the rules or observations of the grammarians by their own knowledge. They are, indeed, sent (to use the author's expression) *to the masters of the grammarians*, that is, to the standard classical writers of the language. Here facts are to be found in abundance, and when the pupil is perfectly familiar with the phraseology of his model, he is never at a loss for the means of verification.

Language is entirely conventional, and we learn to employ it correctly by imitating those who are best acquainted with its recognised forms. A child who mixes in no other society than that of well-educated persons, will as naturally speak with accuracy, as another, whose companions are of an opposite character, will imitate their errors and improprieties. And hence we learn to account for the fact, that a man may speak and write well without knowing grammar. This man has become acquainted with the *masters of the grammarians*, and he therefore speaks and writes grammar as the *Bourgeois Gentilhomme* of Molière did prose without being aware of it.

These preliminary remarks were thought necessary, in anticipation of objections (perhaps not now satisfied) against this particular point of Jacotot's system,*—the finishing, instead of commencing, with the science of grammar. It may now be proper to unfold the method pursued in learning the vernacular tongue, previously intimating to the reader that the exercises, soon to be explained in detail, are the exact counterpart of those employed in acquiring a thorough knowledge of foreign or dead languages. The Universal Instruction has but one route.

The pupil is required to commit to memory the first six books of Telemachus, as an introductory exercise.† These he must know perfectly, so as to be able to repeat them, from one end to the other, without the slightest hesitation; and whenever the teacher mentions the first word of a paragraph or sentence, to continue the paragraph or sentence without the omission of a single word. Many persons to whom this has been mentioned have been at once startled at what they considered so vast a requirement, not recollecting, at the same time, that much more, and (as will be shown) to infinitely less purpose, is exacted from the pupil by the common method. When the six books of Telemachus, or an equivalent portion of any eminent work in the language which the pupil may be studying, is once thus thoroughly impressed on the memory, his labour is almost all over. Every exercise afterwards required of him is little better than amusement; he is in possession of all the necessary materials, and his mind will almost spontaneously employ them. In his book he finds the elements of Grammar, Composition, Criticism, Mental and Moral Philosophy, Logic, the Science of Human Nature in general, History, Geography, Science, &c., &c.—of everything, indeed, that the author deemed it necessary for himself to know, in order to produce his work as it actually exists. He is in thorough possession of the unembodied essence of all the subjects of knowledge just mentioned, though he is not made to stumble and start at their technical nomenclature. Nothing remains but to evolve the various elements, and they are then seen to assume the form and character of distinct sciences. But this is not all; from particular facts, and the particular reflections connected with them, the pupil's mind is led on to analyse circumstances in the aggregate,—to generalise,—to trace the method pervading the whole,—to see the reason of that method,—and thus to enter into the very spirit of his author, and to understand everything, to think upon everything, as the author did while composing his work. These are the advantages which it is not said *may* be obtained, but which actually *have* been obtained, from the employment of the method of Jacotot. Let then calm consideration decide the question, whether it is better to commit to memory a portion of any author equivalent to the six books of Telemachus, that the benefits just mentioned may be gained, or whether the same results as easily follow from the pursuit of the methods generally employed. But Jacotot's system affects much more than has been stated. By means of this process of committing to memory the first six books of Telemachus, and performing the subsequent exercises, pupils of fourteen and fifteen years of age have arrived at a proficiency in composition which would be perfectly incredible did not the development of the method itself furnish data quite sufficient to induce credulity upon this point. These pupils have learned to equal Fenelon in elegance and correctness of style,—to approximate very nearly to Girard in detecting the difference of synonymous words,—to criticise much better than Madame Dacier often did,—to make general observations on literature not inferior to those of La Harpe,—and, in short (for to mention all, would, at this stage of development, provoke positive incredulity), to do more than ever was done by any children, except those who have been by common consent designated geniuses. It will hardly be maintained after this, that the labour necessary to be applied in committing thoroughly to memory six books of Telemachus, is worth a single thought, when such advantages are consequent on the exercise.* But whatever may be said, the fact is, that the aggregate of *words* actually committed to memory is far greater in the common system than in that of Jacotot. Some, however, who feel convinced that this must be true, and that to learn a hundred pages, in order to acquire a language, is in itself no very laborious task, yet object that to commit these pages to memory, so as continuously to repeat them from beginning to end, without hesitation, would, to some children, be quite impossible. M. Jacotot at once denies the assertion, and maintains that *all children have memory, and an equal memory*, and, therefore, that all may be made to learn what any one can learn. He does not indeed maintain that all have an equal will; nor, again, does he assert that those who have not been accustomed to committing to memory will, at first, succeed quite so well as those who are adepts in the exercise. A little practice will, however, give a facility which might have appeared unattainable at the commencement of the attempt. This objection, indeed, cannot be maintained on any ground of argument. We say a child has a bad memory when, in nine cases out of ten, it is inclination, or, to say the least, exercise that is wanted,—not the faculty of remembrance. This very child, were he interrogated on any topic connected with his spontaneous amusements, would very soon convince the questioner, by the infinite variety of facts recollected, that there could not, by possibility, be any radical defect in his memory. Where this really deficient, how could any kind of facts be so minutely remembered, and so clearly particularised? Give, however, the same child a lesson of grammar to learn by heart. He cannot be made to feel the same interest in grammar that he does in sports and games, and besides, he does not understand the subject. What then is the consequence? He pays little or no attention, repeats the stipulated task very miserably, and we infer that he has a very bad memory. It would be more correct to say he has paid little attention to his lesson; and it should then be a point of conscientious consideration, whether we had chosen the proper means for inducing attention, by teasing him with dry technical terms, which he could not understand, and by not properly training his memory—that is, by requiring too much from it at this particular time, without regard to the previous state of exercise to which it might have been accustomed. We owe all our knowledge to memory, for without this faculty the moment we closed our eyes on external nature the mind would be a perfect blank. We possess not a single idea for which we are not ultimately indebted to memory. *Reasoning is essentially based on facts*, and unless the mind possesses the necessary facts, there can be no act of judgment, no connected chain of argumentation. It is the practice of founding our reasonings on the reasonings of others, which leads to mistaken notions and erroneous conclusions. This view of the subject, intended to confirm the brief axioms of Jacotot, is, it will be at once seen, quite incompatible with the observations made by Montaigne, Watts, Edgeworth, &c., that an accurate judgment, and what is called a great genius, may be totally unconnected with a good memory. No great genius ever existed without memory, nor without being indebted to memory for nearly everything which stamped its productions with eminence. Miss Edgeworth, in the Practical Education, labours to show that Shakespeare had a very indifferent memory;—but was not this quite impossible? If he depicts natural scenery, what supplied him with the materials which he put into new combinations, but memory? If he makes general reflections, whence were these obtained, but from particular facts? and how are facts associated and retained for reflection, but by memory? And again, how could the numberless historical facts, upon which he builds the entire structure of most of his surprising dramas, have been in his mind ready for use, if memory had not preserved them? Could Shakespeare, more than any other man, have portrayed with his pen an accurate picture of a thing without previously having the idea of it mentally before him? and could he have derived this idea from any other source than facts? If he himself were personally cognisant of these facts, memory must have treasured his perceptions; if he received them from a secondary source, memory must still have held the record. But because Shakespeare did not sit down in the corner of a room, and commit to memory a set form of words, but chose rather to see things, and because he chose to make his own reflections, and not learn by rote those made by others, is his faculty of memory to be depreciated? The idea is too absurd to be entertained for an instant. It would be much easier to maintain, in direct opposition (though such a hypothesis is incompatible with Jacotot's opinion, already cited), that as we do not precisely know what genius is, Shakespeare's unrivalled eminence was owing to a superiority over other men in the very article of memory. We do not learn facts by intuition, nor do we arrive at general notions, except from facts. Perception supplies us with these, and memory retains them for the use of the mind. But perhaps too much time has been already devoted to this subject, in consistence with the limited plan of the present work. It has been thought necessary to develop it more fully, from the connection it manifestly exhibits to one of Jacotot's most important principles, that *the pupil is directed to commit to memory facts, and to make his own reflections upon them. He never commits to memory the reflections of others, but he is taught to examine the correctness of these by reference to the facts upon which they are of necessity founded.* From all the preceding remarks may be easily seen in what the connection maintained between the memory and the judgment, by the system of the Universal Instruction, really consists. The memory is considered as the faculty which supplies materials for the operations of the mind. This duty is thought to be inefficiently performed, if the stores are suffered to be lost (*for to forget is the same as never to have learned*), or if they remain, like lumber, unappropriated to any useful purpose. The provisions of the system against these mischances are the incessant repetition of everything learned, and the constant vigilance excited in the mind, that every idea introduced there for the first time shall not only find an associate amongst some of the ideas already firmly established there, but shall itself serve the same purpose with reference to any others subsequently introduced, whenever called upon. Thus, all the materials are rendered serviceable, and, as they are permanently retained, no part of the labour spent in the acquisition of them is lost. If then it be allowed that the memory is a most invaluable faculty, and that we naturally acquire all our ideas, whatever they may be, by its instrumentality, we must not forget to follow Nature's plan, with respect to those things which we, to answer particular ends, find it necessary to deposit in its custody. No ideas can long be retained in the memory, which are not deeply impressed by repetition. Were it not for constant repetition, we might even forget our own names, as we frequently do those of strangers. This exercise has been hitherto far too much neglected in education, though even the greatest men—and, in fact, all who have attained to true and solid learning—have invariably availed themselves of its powerful aid. Porson, in early life, was accustomed to repeat the same Greek verses over and over again a great many times, and he attributed to this practice the wonderful facility of reference which he ever afterwards possessed. Permanent retention can, in fact, be ensured by no other process. Repetition, therefore, is considered of vital importance in the system of Jacotot; not a mere repetition of the lesson of the preceding day, or even week, as is the case in some schools, but of everything previously committed to memory. Nothing is omitted. It follows from this that the facts learned and comprehended are seen by the mind, not merely as detached, insulated points, but in all the varieties of analogy, succession, and consequence.

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* It may be here objected, that Milton, Locke, Dumarsais, Dufief, Hamilton, &c., have all more or less developed and enforced this principle, and, consequently, that there is neither merit nor novelty in the adoption of it by Jacotot. To this it may be replied that Jacotot does not assume the novelty of any one of the principles which operate in his system; he merely contends that he has shown the conformity of them to the system of Nature, and brought them together, so as to form a united whole. With respect to other objections on this head, one answer may suffice,—that, with respect to celerity in the acquisition of languages, Jacotot's method far outstrips that commonly designated the Hamiltonian.

† It is to be recollected that the writer of this pamphlet merely employs the illustrations of the author for the sake of convenience. Telemachus is the work by which Jacotot's experiments were made in the tuition of French and Belgic pupils. The choice of the most eligible book, for a similar course, as adapted to instruction in England, might require much deliberation. We have not perhaps any work so well fitted, in all respects, for our purpose, as Telemachus is for theirs. The continental pupils of Jacotot's system, who learn English, are directed to commit to memory a portion of Johnson's Rasselas, making this their model-book. There are, perhaps, some objections to selecting Rasselas, as a standard of style; though most parents, it is believed, would be well satisfied, were their children taught to write English as well as Johnson,—an attainment which this system puts completely within their reach.

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* The benefits of this exercise, it may be observed, are not restricted to the immediate purposes of the scholastic education in view. Every person tutored by the system of Jacotot will doubtless be able to commit anything (whatever it may be) to memory more speedily, and to retain it more durably, than one unaccustomed to the process of this system. The pages indelibly stamped on the memory, as above directed, and anatomised (so to speak) by the subsequent interrogatory scrutiny, will form in the mind a grand mnemonical gallery of pictures with which almost everything within the range of human knowledge will form some kind of association. Schenkel's once very celebrated system of mnemonics was founded upon a principle similar to this.

Learn then by heart, and understand, says Jacotot, *the first six books of Télémaque, or an equivalent portion of any eligible work in the language to be acquired, and repeat it incessantly. Refer everything else to this, and you will certainly learn the language.* The following is the method proposed by Jacotot, in order to attain that perfect mental retention necessary to the efficient operation of this system.

The pupil must learn every day a sentence, a paragraph, or a page, according as his memory is more or less habituated to this exercise; and he must never fail to repeat all that he has previously learned, from the first word of the book. Thus, if he learns one sentence at first on the following day he learns the next sentence, but repeats the two, commencing with the first word of that previously learned. The same method is pursued to the end of the sixth book. As however this repetition, as the pupil goes on necessarily occupies much time, it is sometimes found advisable to divide the portion thus accumulating; but still the general repetition of the six books must have place at least twice a week. The oftener the whole is repeated, the more prompt and durable are the results.

It is confessed that the preceding exercise is tedious and wearisome, and great care is required on the part of the teacher to prevent it from becoming repulsive and disgusting to the pupil.* Too much must not at first be exacted. If the child cannot learn a paragraph in a day, let him learn two sentences, one sentence, or even a single word. At all events he must learn something thoroughly; on the next day he will learn something more, still repeating what has been previously learned; and after a fortnight's practice there will be little reason to tax him with want of memory. When the pupil knows the first six books of Telemachus thoroughly, it is not necessary to commit the remaining eighteen to memory; but he must read every day some pages of them, with a degree of attention sufficient to enable him to *relate* what they contain. This is a very important exercise, and is on no account to be neglected. The recital of the pupil serves as an evidence of the attention that he has paid during his perusal, and what is more, accustoms him to the practice of speaking without hesitation upon a fact present to his memory, and of employing expressions which he has seen used in the book, in accordance with the peculiar circumstances of the fact or facts narrated. By this means he becomes accustomed to the use of words as the signs of ideas actually in his mind; and hence results propriety and facility of diction. He speaks of what he understands, and of course speaks clearly, and, in a certain degree, well. This second exercise, however, on no account excludes the general or partial repetition of the first six books, which the pupil must go through at least once a week, even when they are fixed immovably in his memory.

The pupil's greatest difficulties are now conquered. He knows all he ought to know: *as he knows one book he knows all books.*† All that now remains for him is to *distinguish*, to *compare*, and to *refer*. The materials have been stored, and the mental faculties are now called upon to do their part. It is singular, that what is generally accounted the most difficult point of attainment by the common method of tuition, the getting the pupil to think, becomes, in the system of Jacotot, the easiest. The pupil cannot help thinking,—that is, he cannot help noticing resemblances, and distinguishing differences, and consequently exercising his judgment, when led on according to the process now to be illustrated. Previously, however, what was formerly intimated may be again remarked, that *the master*, who pursues the method of the Universal Instruction, *tells the pupil nothing. He explains nothing, insists upon nothing, affirms nothing. The pupil is taught to see everything himself, and to make his own reflections, not to receive those made by others.* He is called upon to answer the repeated interrogations put to him by his teacher—which, however, tell him nothing; they only lead him to view the subject in all its points of observation. This view must be the same that his mind, were it actuated by the free impulses of his will, that is, were he really desirous of thoroughly comprehending the matter, would of necessity take. Hence is the system of Jacotot undeniably based on the system of Nature.

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* It is submitted, with much deference, that were some few of the admirable exercises which succeed this mnemonical practice, to precede it, much of the difficulty, confessedly great, of committing thoroughly to memory a mass of words but imperfectly comprehended when first learned, would be obviated. If the pupil were made to read carefully over each passage to be committed to memory, and rigidly interrogated as to the meaning, until all the ideas which it embraced were comprehended by his mind, the task of subsequently learning it by heart would be comparatively slight; nor does it appear that, by so doing, any one principle of the system would be sacrificed; since the same interrogations might be afterwards repeated. Still, however, this is merely a suggestion; of its propriety let others judge.

† The strict import of this phraseology will be more apparent hereafter; for the present it is sufficient to enunciate it as the dictum of Jacotot.

In pursuance of this method, the pupil is directed to read the two first paragraphs of the first book. He is told to pay the utmost possible attention to them; and *the teacher then puts questions to him on every word and phrase*, on each paragraph, and on the two together: and, in short, the passage is not dismissed from view until it is evident that nothing has escaped the pupil's attention.

The manner in which this is done will now be made to appear; and it may be recollected that the principle on which its efficacy depends is that the author would not have used every word, unless every word had been necessary to convey his ideas to the reader. If, then, it was necessary for the author to employ all the words and expressions brought before us, it must be equally necessary for us to understand them. That the full force of this exercise may be apparent, a translation of the first paragraph (altered from Hawkesworth's, which is too diffuse) is subjoined.

"The grief of Calypso for the departure of Ulysses would admit of no comfort. In the height of her sorrow, she even regretted her immortality. Her grotto echoed no more with the music of her voice, and her attendant nymphs dared not to address her. She often walked alone upon the flowery turf, with which an eternal spring had decked the borders of her isle; but the beauties which bloomed around her, far from soothing her grief, only revived the sad remembrance of Ulysses, who had been so frequently the companion of her walks. Sometimes she stood motionless upon the beach, which she bedewed with her tears, turning herself incessantly to that direction in which the vessel of Ulysses, cleaving the waves, had disappeared from her view."

The following questions and answers are, of course, given merely as illustrations. If the method be thoroughly comprehended by the teacher, he will, with the greatest ease, adapt himself to the circumstances of the case. Taking then the first sentence—

The grief of Calypso for the departure of Ulysses would admit of no comfort—

The teacher asks—Who was gone?

The pupil answers—Ulysses.

Q. Who was grieved?

A. Calypso.

Q. Who were Calypso and Ulysses?

A. I do not know.*

Q. What was the cause of Calypso's grief?

A. The departure of Ulysses.

Q. Did Calypso love Ulysses?

A. Yes.

Q. How do you know that?

A. Because her grief for his departure would admit of no comfort?

Q. Was she slightly grieved, or very much?

A. Very much.

Q. What do we call that grief which admits of no comfort?

A. Inconsolable.

The teacher will use his own discretion as to asking such questions as the last, which require in the answers the use of words and phrases not to be found in the original sentence. It is generally thought advisable to confine the attention solely to questions which will introduce the very words of the sentence under notice. If, however, such interrogations as the last be made, the pupil will not find the slightest difficulty in giving appropriate answers. When once he understands the idea, he will surprise his teacher by the many modes in which he shows himself capable of giving it expression. He will be found to have a distinct perception of the very lights and shades of the images depicted on his mind. The teacher may ascertain this to his own perfect satisfaction, *without telling or explaining to his pupil a single word.* The mind is to be *directed,* not *taught.* It is to be placed so that it may see the subject in every possible point of view, and the interrogation must be continued, until the entire scene, the actors, the action performed, the cause and object of the action, the modifying circumstances, &c., &c., are all distinctly in view.* Not a word must be neglected. This comprehends the *learning thoroughly;* and the practice of *referring everything to the first thing learned* can, as will be seen directly, even at this initiatory stage, be brought into question. The next sentence is read:—

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* The pupil is supposed to know nothing of the characters, but what he can obtain from an attentive examination of every word which relates to them in his book.

In the height of her sorrow she even regretted her immortality.

Q. To whose sorrow is reference here made?

A. To that of Calypso.

Q. Who was immortal?

A. Calypso.

Q. Why did she regret her immortality?

A. Because Ulysses was gone, and in her sorrow she would have wished to die.

Q. Why wish to die?

A. That she might lose her sorrow.

Q. Why could she not die?

A. Because she was immortal?

Q. What is it then to be immortal?

A. Not to be able to die.

Q. What do we know of Calypso from this sentence?

A. That she was sorrowful and immortal?

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* The particular attention of the reader is requested to this part of the system, for it is to the analysis (by means of the interrogatory process above explained) of every complex idea presented to the pupil's notice, into its component simple ideas, that the wonderful results of Jacotot's method are ultimately owing. An illustration of the efficacy of this plan is afforded by the instance of Abbé Longuerue, who lived in the reign of Louis XIV, a man (to use D'Alembert's expression) of "prodigious memory and terrible erudition." He wrote a folio history of France entirely from memory, without referring to a single book. When once asked by the Marquis d'Argenson to what he attributed his surprising powers of retention, he answered, "Sir, the elements of every science—the first principles of every language—the a, b, c, as I may say, of every kind of knowledge,—must be learned whilst we are very young. This is not difficult in youth, especially as it is not necessary to penetrate far,—*simple notions are sufficient; when these are acquired, everything we read afterwards finds its proper place.*"

Q. Did we know these circumstances from the first sentence

A. No; only one of them, that she was sorrowful.

Q. What more then do we now see?

A. That she was immortal.

Q. Was Ulysses immortal?

A. I do not know.

Some may consider such questions as these ridiculous, and find abundant matter for sport in the idea that this kind of exercise should ever teach a child to write his own language, as well as the author whose work is put into his hands. Some again will contend that there is not the least novelty in it, and that the practice of interrogation is pursued by every teacher who wishes to ascertain the knowledge of his pupil. To the former party of objectors Jacotot simply says, *Try, and you will be sure to succeed; an experience of ten years warrants my prediction;* and to the other party he replies, I acknowledge you ask questions, but your questions are confined to the technicalities of grammar; and I propose to reverse the order that you follow, and to finish by grammar. But he might have said more than this. No plan of interrogation was ever so eminently successful as that now proposed, for *it puts the pupil in full possession of every idea that is brought before him,* and, as he finds himself able to answer every question, he gains confidence as he advances, and perceives every difficulty vanish before him. Nine-tenths of the actual waste of time, in the common method, arises from the pupil's obtaining an indistinct perception of many things, which lie in the mind in a disjointed and disorderly state, because the mutual bond of connection is hidden in the obscurity which veils them. If he knew a little more about them, all would be clear; as it is, almost everything is misty. The system of Jacotot allows of no such semi-perceptions. The youngest child may, with the slightest attention, answer these questions, and consequently comprehend the successive ideas which they are intended to lay open before him. We proceed to the next sentence:—

Her grotto echoed no more with the music of her voice, and her attendant nymphs dared not to address her.

Q. To whom are we referring here?

A. Calypso.

Q. Was she accustomed to sing?

A. Yes.

Q. Was she always singing?

A. No; she did not sing now.

Q. How do you know that?

A. Because her grotto echoed no more with her voice.

Q. Where did she generally sing?

A. In her grotto.

Q. Why did her grotto echo no more with her singing?

A. Because she was sorrowful.

Q. Who were Calypso's attendants?

A. Nymphs.

Q. Why did they not dare to address her?

A. Because she was sorrowful.

Q. What more of Calypso do we know than we did before?

A. That she had a grotto, that she sung, and that she was attended by nymphs.

She often walked alone upon the flowery turf, with which an eternal spring had decked the borders of her isle; but the beauties which bloomed around her, far from soothing her grief, only revived the sad remembrance of Ulysses, who had been so frequently the companion of her walks.

Q. Where did Calypso walk?

A. Upon the flowery turf.

Q. Where did she live?

A. In an island.

Q. Did we know that before?

A. No.

Q. Was it cold in the island of Calypso?

A. No; there was an eternal spring.

Q. In whose company did she walk?

A. She walked alone.

Q. With whom had she been accustomed to walk?

A. With Ulysses.

Q. Why did not she walk with him now?

A. Because he was gone.

Q. How do you know that?

A. Because in the first sentence the grief of Calypso for the departure of Ulysses is mentioned: this shows he was gone.

Q. Why was the remembrance of Ulysses sad?

A. Because Calypso loved him, and he was gone away from her.

Q. Why did Calypso now walk alone?

A. Because she was sorrowful.

Sometimes she stood motionless upon the beach, which she bedewed with her tears, turning herself incessantly to that direction in which the vessel of Ulysses, cleaving the waves, had disappeared from her view.

Q. In what part of her isle did Calypso dwell?

A. Near the seashore.

Q. How do you know that?

A. Because she often walked on the turf which was on the border of her isle, and because her grotto must have been near at hand, or it would not have been mentioned.

Q. Do we know, from the preceding sentences, in what manner Ulysses had departed?

A. No.

Q. Do we now know?

A. Yes; in a vessel.

Q. Was the vessel of Ulysses still in view?

A. No; it had disappeared.

Q. Why "cleaving the waves?"

A. Because the vessel was in motion.

Q. How do you know that?

A. Because, if it had been still, it would not have been said to cleave the waves.

Q. Can you give any other reason?

A. Yes. If it had been still, it would have been yet in view.

The foregoing illustrations may suffice to show what is meant by *asking questions on every word, phrase,* &c. After each sentence of the first two paragraphs has been thus passed through, the teacher may propose questions on each paragraph, then on the two together. This may be illustrated with reference to the first; its further application will be obvious.

Q. What persons have been mentioned by name in this paragraph?

A. Two: Calypso and Ulysses.

Q. What do you know of Calypso?

A. Calypso was a female, an immortal, attended by nymphs and dwelling in an island. She lived near the seashore.

Q. What is she said to have done in this passage?

A. To have walked alone; to have repulsed her nymphs; stood still weeping by the seashore, &c.

Q. Why did she act thus?

A. Because she was sorrowful.

Q. What do we know of Ulysses?

A. Ulysses was a man who had accompanied Calypso in her walks, whom she loved very much, and who was now gone away in a ship.

When the attention of the pupil begins to waver at all, it is proper to ask questions, which, unless he were strictly on his guard, would lead him into an absurdity. Thus, for instance, Ulysses went away:—

Q. Did Ulysses go away in a coach?

A. No; in a ship.

Q. Did he go along the high road?

A. No; he went upon the sea, and there are no roads on the sea.

Q. Is it expressly said that he went on the sea?

A. No; but he could not have travelled in a ship except on the sea; and, besides, this expression "cleaving the waves," shows that the sea must be meant.

The pupil in this way becomes well acquainted with each word, phrase, paragraph, several paragraphs united, and, in short, with an entire book. As the exercise is continued, and the pupil accustomed to answer, his progress becomes more and more interesting. Every new character, every new fact, or group of facts, must be compared with those that have preceded. The unremitted vigilance of the teacher must stimulate the pupil to instruct himself, by reflecting on the facts of his book, by associating and classifying them, and by putting them into new combinations. Especial care must however be taken (as has been already hinted) that *no questions be asked, the answers to which are not to be obtained from the book that the pupil knows.* It matters not in what part they may be, for though the elements of the solution be scattered, the memory will reunite them. *The understanding always sees well what it really sees, and we reason amiss only when we speak of what we do not see.*

A very interesting exercise is now proposed to the pupil,—that of defining words by the comparison of passages solely derived from his model-book. Thus, suppose for instance, he were asked—

What is the meaning of the word "*Spring?*" He answers,—I observe the word Spring in the following passages:—*Flowery turf, with which an eternal Spring had decked, &c.* (book i.)—*They brought all the fruits which Spring promises, and Autumn, &c.* (b. .) —*He celebrated the flowers which crown the Spring, the fragrance which she diffuses, and the verdure that rises under her feet* (b. i.), *&c., &c.*

Well, says the teacher, what reflections do these passages excite in your mind?

A. I see that Spring is that season of the year in which fragrant flowers begin to bloom, buds to open forth, birds to sing, &c., &c.

As the pupil advances, he is *exercised* in *generalising;* that is, speaking of a particular fact in a manner applicable to all facts of the same nature. *He is not taught to generalise; the faculty is common to all men. Let him be made to direct his undistracted attention to the subject before him, and he will reason upon it as well as his instructor.* In order then to bring this faculty into exercise,—as soon as a great number of questions (similar to those given for the sake of illustration) have been proposed on the first paragraph, the pupil is asked, What do you perceive in the whole of this paragraph? He will answer, probably, *grief, sorrow,* or something of the kind. Suppose he answers *grief.* He is immediately asked, What then is grief? and he is at once obliged to generalise.

The answer to the question, What is grief? founded upon the facts of the paragraph under review, will of necessity assume a form similar to the following, which is, indeed, the translated reply of a child who had just commenced the study of his own language.

"Grief is a passion of which we become sensible after the loss of any one dear to us. The person who experiences grief seeks solitude, ceases to take delight in the most agreeable places, and repulses the attentions of those who would willingly administer solace."

As soon as this, or a similar composition, is produced by the pupil, he is called upon to justify every sentence employed, by reference to the facts from which his general notion is derived. Thus the teacher asks—

Why do you say, *Grief is a passion of which we become sensible after the loss of any one dear to us?* The pupil replies, Because, after the departure of Ulysses, the grief of Calypso would admit of no comfort.

Q. Why do you say, *The person who experiences grief seeks solitude?*

A. She often walked alone on the flowery turf, &c.

Q. Why have you said, *Ceases to take delight in the most agreeable places?*

A. Calypso took no pleasure in her beautiful isle; she noticed not the flowery turf; she thought of nothing but Ulysses.

Q. Why say, *Repulses the attentions, &c.?*

A. Her attendant nymphs dared not to address her.

The composition in question, it should be remarked, is generally submitted to three distinct readings. After the first, it is examined as a whole; after the second, the pupil gives an account of the facts upon which he has written; and, after the third, particular attention is paid to individual words, and to improprieties of diction, if they occur. During the first reading, the pupil is made to pay great attention to the manner in which he reads; he must pronounce very distinctly all the syllables of each word, and introduce the proper inflections of voice. At the second reading, without waiting for questions, he should explain his composition in the following manner: "I have said, Grief is a passion of which we become sensible after the loss of any one dear to us; because I have seen, that after the departure of Ulysses the grief of Calypso would admit of no comfort, &c., &c. After the third reading, the pupil may be required to point out in Telemachus every word and phrase that he has employed; for it is distinctly understood, that he must never wander from his guide. Every expression not authorised by his model, even though perfectly correct, is inadmissible. This restriction ensures propriety of language, for he is of necessity obliged to seek his phraseology from passages which he well understands, and the ideas arising from which are, of consequence, distinctly associated in his mind, with their appropriate verbal signs. As long as he remains in pupilage he must follow the model book as his guide in every respect. Afterwards, when he has acquired sufficient experience to pursue his way alone, nothing will prevent him from employing or imitating the expressions of other eminent authors. He will, indeed, do this without previous reflection, but never without being able to justify his language by reference to good authority.

Another very important exercise is made to depend upon what Jacotot calls the oratorical artifice of *repetition.* The meaning of this term will better appear from the following example than from any brief explanation which could be given.

Q. Of what does the first paragraph of Telemachus consist? (see p. 363.)

A. Of the fact—that Calypso's grief for the departure of Ulysses was inconsolable: it therefore contains three things; Calypso (1), her inconsolable grief (2), and the departure of Ulysses (3).

Q. How do you prove this?

A. *In the height of her sorrow,*—and—*she even regretted,* &c., are only repetitions of—her grief was inconsolable. *Her immortality,* gives the idea of Calypso. *Her attendant nymphs*—this makes me think of Calypso—*dared not to address her*, reminds me of her grief. *Her grotto* (1) *echoed no more,* &c. (2). *She often walked alone* (2) *upon the flowery turf*, &c. (1). But these beautiful places (1), *far from soothing*, &c. (2), *only revived the sad remembrance*, &c. (2, 3). *She incessantly turned*, &c. (1, 2, 3), *to the direction in which*, &c. (3).*

Now that the pupil can answer every question propounded to him, can generalise, and justify everything that he has said or written, it only becomes necessary to vary his exercises, and thus to lead him gradually and easily to write whenever and upon whatever he pleases; and finally, to speak extemporaneously upon a given subject. The entire course, then, comprehends the following exercises:—

1. To imitate.
2. To make general reflections upon known facts.
3. To distinguish between synonymous words.
4. To distinguish between synonymous expressions.
5. To examine parallel subjects.
6. To examine analogous thoughts.
7. To transfer or translate the reflections arising from one subject to another somewhat similar.
8. To analyse a chapter, book, poem, &c.
9. To develop or paraphrase the thoughts of an author.
10. To find subjects for transference.
11. To write upon a literary or critical subject; to furnish descriptions of things observed.
12. To imitate a thought.
13. To write letters.
14. To portray a character.
15. To compare characters.
16. To write tales, sketches, &c.
17. To verify the grammar.
18. To write upon any given subject in a given time.
19. To speak extemporaneously upon a given subject.
20. All is in all.

During the performance of all these exercises, the pupil continues the general repetition of the six books of Telemachus, and the reading (accompanied with recital) of the remainder.

A very brief notice of the most important exercises must in the present instance suffice. A more ample development may be hereafter furnished.

1. *Imitations.*—In writing *an imitation*, the pupil applies the

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* The purport of this exercise is too obvious to need explanation.

terms which express a general sentiment by means of special facts, to the development of the same sentiment under different circumstances. Thus, Calypso *regretted the departure of Ulysses*, and Philoctetes, in the fifteenth book, *regretted his perjury*, in betraying the secret of the burial place of Hercules. Inasmuch, then, as the same sentiment is exhibited in the two instances, so will the general terms of expression be the same, or very similar. The circumstances alone entirely differ. To describe one, therefore, taking the other as a model for general phraseology and succession of circumstances, is to produce an *imitation*. Thus, to recur to the instances already cited, the pupil preserves the features of regret and sorrow in both; but takes due care to notice, that Calypso was a goddess, Philoctetes a mortal; that the one lived in a beautiful island, and was attended by nymphs, that the other inhabited a solitary cavern, and was surrounded only by wild beasts; that the former lamented the loss of a being whom she had loved, that the latter deplored the commission of an irretrievable act of bad faith, &c., &c. All the points of distinction in the two cases must be noticed, while those only are to be preserved in the composition, which belong to the subject of the imitation. A sentence or two from a piece written by one of Jacotot's pupils, may illustrate this exercise.

"The grief of Philoctetes for having revealed the secret of Alcides' death, which he had sworn to conceal, would admit of no comfort. In the height of his sorrow he found the remembrance of his perjury less supportable than the cruel abandonment of the Greeks, the treachery of Ulysses, and the dreadful agonies occasioned by his wound. Night and day his groans reverberated through the cavern in which he dwelt," &c., &c.

After the pupil has read his composition aloud, he is called upon to justify the introduction of each circumstance.

Q. Why have you said, *For having revealed the secret of Alcides' death?*

A. Philoctetes says himself (see 15th book), *I eluded the vow that I had made to heaven, &c.*

Q. Why, *which he had sworn to conceal?*

A. Philoctetes also states this himself, *The secret which I had sworn to keep.*

Q. Why mention, *The abandonment of the Greeks, the treachery of Ulysses, &c.?*

A. All these facts are particularised in the history of Philoctetes, at the commencement of the fifteenth book of Telemachus, &c., &c.

It is easy to amplify this, as every other series of questions proposed in accordance with the system, to any extent. The only direction that can be given with respect to their number, is, that *the pupil must be interrogated until he evinces, by accounting for every expression employed, a perfectly accurate conception of every idea.*

The exercise of *imitation*, now under notice, is especially useful in habituating the pupil to employ correct phraseology.

2. *To make general reflections upon particular facts.*—This exercise is merely an extension of that before referred to under the name of generalisation. The pupil now takes a wider range of facts, and introduces into his composition a greater number of reflections. He is told to consider attentively a given passage or passages of his author, and to derive therefrom the reflections connected with a proposed subject. His success will evidently be proportionate to the combinations of facts which his memory will enable him to form, and to the care with which he notices every part of his subject. He thus learns to perceive how the actual state of things under review is influenced by the modifications of the sentiment which he is required to develop. Children begin to generalise naturally, and to study the reciprocal relations of cause and effect, at a much earlier age than we are accustomed to consider; but their faculties often lie dormant because we overlook their existence. The process of Jacotot's system leads the young pupil to observe, that he partakes in the common features of human nature, and hence spontaneously generalises upon matters which concern him. By extending this principle, he considers that were he placed in circumstances similar to those unfolded in his book, his actions would, for the most part, resemble those attributed to the personages under his notice. He knows as well that sorrow attends the loss of anything he may have held dear, as that the sunbeams do not freeze water; and hence he acknowledges that the grief of Calypso, for instance, resembles human grief in general. This is the true basis of the exercise in question.

Every sentence that the pupil reads and thoroughly understands, must suggest a reflection of some kind or other. If, then, he discovers in every instance the name of this reflection,—the proper terms in which it should be expressed,—the difficulty is over.

To exemplify the exercise is unnecessary. It should be remembered, that the pupil must be able to justify every reflection by reference to the facts upon which it is founded.

As soon as the pupil is tolerably well accustomed to this kind of composition, it is considered advisable to exercise him in *speaking upon different subjects.* The greatest difficulty is, to induce him to make the attempt; but when once his reluctance has been overcome, he will easily advance, and with undoubted success.

3. *Synonymous words.* 4. *Synonymous phrases.*—When called upon to distinguish between words or phrases, generally accounted synonymous, the pupil, in the first instance, repeats from memory a number (the extent of which may be determined by the teacher) of sentences containing the words or phrases in question, and he is particularly urged to recollect the precise circumstances in which they were employed by the author. He is then required to produce a general composition, founded upon the special facts under his notice, of every part of which composition he is finally made to render an account.

When he becomes well practised in this exercise, he is shown, that the authors who have written on synonymy have arrived at their results by pursuing a method precisely similar to that in which he has been led; and that if their productions are more methodical and elaborate than his own, the only reason for this superiority is found in the greater patience and attention that they have bestowed on the subject. Thus, for instance, the explanation of any particular word, as given by some reputable writer on the subject (Girard, or Crabbe, or Hill, for instance), is read to the pupil, and he is told to justify every part of it by facts with which his memory will supply him from the pages of Telemachus. By no means the least advantage consequent upon this practice is, its leading the pupil to discover, that in *learning one book thoroughly he learns all books;* for the writer of the synonymes undoubtedly collected his observations from a vast number of sources, though this exercise proves that the justificatory facts may be derived from a single one.

5. *Parallel subjects.* 6. *Analogous thoughts.*—As a preliminary part of the former of these exercises, the pupil is required to furnish an analysis of all the books of Telemachus. The following short specimen of an analysis of part of the first book may suffice to give an idea of what is meant:—*regrets,—artifice,—entreaty,—imitation,—situation,—advice,—repast,—invitation,* &c. In this way, the pupil learns to notice the different parts of his author, in which similar subjects are treated, and he is then required to contrast the manner of composition in any two or more of them. For instance, Telemachus, in the first book, addresses Acestes,—and in the second,—,

Sesostris—the pupil must compare the circumstances under which these addresses were made, and their respective objects—

1st. Telemachus, wandering in search of his father, is in the presence of a king; the subject is the same.

2nd. The situation is the same. He is in the power of Acestes, —he is in the power of Sesostris.

3rd. But Acestes speaks harshly to him,—Sesostris treats him with kindness, &c., &c.

The above will serve to show the design of this exercise, to the careful performance of which great importance is attached.

The process of examining analogous thoughts requires no explanation. The pupil has only to perform with the general reflections, what he has, in the preceding exercise, performed with the facts of his author. As a variation, the pupil is told to open any book whatever, at random, and read aloud the first sentence that his eye may happen to glance upon. He is then asked to bring to mind reflections or facts in Telemachus similar to that accidentally discovered in the book which he opens. It will rarely happen, that a single reflection can thus come under his view, in which he cannot observe some point of similarity to those already remarked in the pages of Telemachus. *Sometimes a maxim is selected from any book of general reflections, and the pupil is required to justify it by facts from Telemachus.* Wherever he turns his eyes, he perceives Fenelon; and hence Jacotot contends, that *one book contains all books*, or more generally, that *All is in all.* In this technical expression, *All is in all*, is comprehended the fundamental principle of the Universal Instruction.

7. Translation or Transfer.—This exercise is somewhat similar to that termed *Imitation*, but differs from it in assuming a more general character. In the latter, particular circumstances are imitated; *translation* consists in imitating the general reflections derived from those particular circumstances, and it therefore embraces the results of two distinct operations of the mind. The pupil must generalise before he can transfer,—this is not necessary in the exercise of imitation, in which a simple comparison of facts is required.

Thus it was before seen, that the circumstances of Calypso's grief resembled, in several respects, those which evidenced the wretchedness of Philoctetes, and upon this observed similarity was founded an *imitation*. The regret of Calypso, stripped of the accessory circumstances, must resemble, in certain points, all regrets whatever. Hence *the regrets of the victim of ambition*, may be modelled on the *regret of Calypso*, and thus will be performed the exercise of *translation*. Every passage in the book may furnish materials for it, and by the combination of passages, one with another, the resources become positively inexhaustible.

It would be impossible, consistently with the plan of the present publication, to enter into the details of the succeeding exercises. If those already explained have been rendered intelligible, the slightest consideration will suffice to show the nature and object of the rest. The 12th is a very important exercise.—*To write on any subject whatever*. Thus, an ode, a sonnet, an oration, &c., &c., being put into the pupil's hands, he is required *to determine from the production itself, the rules of art according to which it is constructed*. Whatever be the subject, he learns to describe it in the common language with which he is acquainted by his previous training. The dialects of science and art he may subsequently acquire. He is exercised in *Epistolary Composition*, by being obliged to write letters, with an object in view, and upon subjects which he well comprehends. Thus he keeps up a fictitious correspondence between Penelope, Telemachus, Mentor, Ulysses, &c. In making *Portraits*, the pupil traces biographical sketches of the various personages of his model-book, abstracting their characteristic features from the associations in which they are originally found. To this succeeds the exercise of comparing one *portrait* with another, or, as it is termed, making *parallels* (after the manner of Plutarch), the inportance of which speaks for itself.

Last of all comes the *examination of grammar*, the comprehension of which is rendered by the previous course remarkably easy, for the pupil already knows the language. He is now only called upon to remark the correctness of his own observations, and to verify the observations of others by comparison with facts which have long been in his possession. This verification forms a *vivâ voce* exercise for the pupil, and, when once gone through, will scarcely need repetition. He is told beforehand, that the study of grammar will add nothing to his knowledge of the language, as far as words and phrases are concerned, and that he will not be supplied by that science with resources of expression previously inaccessible. He simply learns the technical verbiage adopted to express the observations made upon the nature, order, and reciprocal relations, of the words of the language. By comparing, therefore, his own observations with those of the grammarian, the pupil acquires the conventional terms in which they are appropriately expressed.

A grammar is put into his hands, which he is directed to read, at the same time carefully reflecting upon every sentence, and producing from Telemachus examples confirmatory of every observation and rule met with. Thus, for instance, he reads,—A noun is the name of anything which exists, or of which we have any notion. This definition he at once justifies by adducing the words *grotto*, *turf*, &c., as the names of things that exist; and *sorrow*, *anger*, &c., as the names of things of which he has a notion. This example will suffice to show the nature of the exercise.

The exercises of *extemporaneous composition and speaking* upon a given subject (and, in the former cases, within a given time of ten minutes or a quarter of an hour), are rather to be considered as developments of the astonishing capabilities of the system, than as necessary parts of the process employed. The pupil who shall have performed every previous exercise, will, of necessity, be competent to the performance of these, since all the elements which enter into them will have become perfectly familiar to him by incessant repetition. He has been habituated to the *vivâ voce* recitation of facts from the very commencement, as well as to repeated compositions, both specific and general, and he is now required to perform, in an unpremeditated manner, that which was, in the first instance, the work of mature deliberation. Surprising, then, as are exhibitions of this kind, when considered by themselves, they appear simply as the natural results of the previous process, to any one who carefully estimates the end attained, by the propriety of the means employed. But it should be remembered, that such results were never before attained by any process, nor are they now attainable by any other than that of Jacotot, for the Universal Instruction is the Educational System of Nature.

The last exercise consists in verifying the assertion, *All is in all.* As soon as the pupil knows Telemachus, he is required to point out, speaking extemporaneously, the particular art exhibited by Fenelon in the composition of that work; he is directed to refer other productions of literary art to this, and to observe, that the human mind, under all circumstances, whatever be its ends or means, follows very nearly the same route. It is scarcely possible to take any two sentences from any two works of the most opposite character and nature, without observing some points of similarity. If the whole of one complex idea is not like the whole of another, some of the subordinate components will discover mutual analogies and relations. Thus, every action must be like every other action in several respects. No action can be performed without an agent and an object, nor without the intervention of motion. Other circumstances may vary, but these are of necessity fixed. More generally it may be asserted, that though one book does not, strictly speaking, contain all others, yet it contains some particulars which are common to all others: it contains the starting-points of all knowledge, though not the amplification of the full course. It has been remarked, that the entire amount, independent of repetitions, of human knowledge, might be comprehended in a very few volumns. The method of Jacotot tends to confirm the correctness of this observation, and the proposition, *All is in all*, in fact, the fundamental principle of the system. It is because *All is in all*, that the precept, *Learn something thoroughly, and refer everything else to it*, leads in practice to results so astonishing as those which are the proud trophies of the Universal Instruction. Hence it is, that by a thorough acquaintance with the words, syllables, and letters, of the first sixty lines of Telemachus, the pupil is taught to read,—that by writing only one line well, he learns the entire graphic art,—that by completely mastering one book, he masters all books,—that is, acquires the language. It would be easy to show, that this principle is not limited to the bare facts just enumerated,—to the mere operative machinery of education,—but that it pervades the Universe of Nature. It only assumes another form when we call man a microcosm,—a miniature of the entire mass of human intelligence. It is merely modified by Byron, when he says,—

> ———History, with all her volumes vast,
> Hath but one page:

and again, contemplating a solitary ruin of Rome,—

> Ages and realms are crowded in this span.

Lady Montague, when she wittily said she had travelled from London to Constantinople, and could find nothing but men and women, and the common sense of mankind, when it pronounces that Men are ever the same,—merely diversify the proposition, *All is in all*. The observation has been made thousands of years ago; but Jacotot has first conceived the idea of rendering it practically useful, of deriving from it a precept applicable to the acquirement of the various elements of Universal Knowledge. *He then*, says Jacotot, *who knows one book knows all books*, for *all is in all*. Let not the expression be contemned. Those who have shone most as divines, poets, mathematicians, orators, sculptors, or painters, were men who devoted themselves to one book, to one model. The profound theologian is he who is thoroughly acquainted, not with countless glosses and comments, but with that one book,—the Bible. The argument likewise receives confirmation from the fact, that Demosthenes wrote out the Greek History of Thucydides eight times,—that Racine committed to memory, and repeated very often, the entire works of Euripides. Will not he who is thoroughly master of the Iliad find a translation of it in the Æneid, and again, for the most part, in Paradise Lost? This observation respects ideas only; but considering both language and ideas, is not the Iliad of Homer to be found in the greater portion of the dramas of Æschylus, Sophocles, and Euripides? Without doubt,—and he who knows (according to the system of Jacotot) the Iliad, will have very few difficulties to contend with in reading the Greek tragedians. He who would be a geometer learns thoroughly Euclid's Elements, and refers everything connected with geometry to them. Again, a grain of sand resembles a world; and the assertion in mathematics, that two and two make four, is analogous to this in moral reasoning,—that an accumulation of facts strengthens conviction; increased consequent force are common to both; hence *All is in all.* In Telemachus, then, is found grammar, history, geography, &c., and, in fact, all the subjects before particularised. The author abbreviates in some passages what he amplifies in others. He imitates himself; he translates himself; he does, in short, everything that the human mind can do, in any science whatever.

To show how the principle is verified, the teacher opens any author,—Massillon, for instance, and reads—

"Pleasure is the first thing that endangers our innocence. The other passions develop themselves and ripen (so to speak) only with the advancement of reason."

The pupil is asked if he can verify the reflections of Massillon by the facts of Fenelon; and he answers in the following manner:—

Telemachus, yielding to pleasure in the island of Cyprus, shows that *pleasure endangers innocence*, and it is the *first thing;* because, on the first occasion in which Telemachus found himself exposed to peril, pleasure was the cause. The *other passions*, &c.—this is seen by Telemachus in the camp of the allies, by Idomeneus, &c.

It is easily seen that this exercise may be diversified to an indefinite extent. Not merely literary productions, but all works relating to science and the fine arts are submitted to its operation, and the result, in every case, verifies the proposition, *All is in all.* The same thing may be said of the system itself, properly designated from its comprehensiveness, Universal Instruction. Here *All is in all;* the features of the whole are discoverable in every part, and its method, therefore, is the exact counterpart of the method of Nature.

The brief exposition originally contemplated is now brought to a termination, and the system of Jacotot is before the reader. It would be incompatible with the evident design of the present publication, to show the manner of applying the principles enforced and illustrated in the preceding pages, to the various subjects generally considered to form an Education. If, however, the reader thoroughly comprehends the precept, *Learn something thoroughly, and refer everything else to it,* he will have no difficulty in perceiving the manner of its application to them. The pupil must still learn by heart,—repeat incessantly,—compare by reflection,—and verify the observations of others; and the teacher must still be careful to explain nothing,—to interrogate perpetually,—to make the pupil discover his own errors, and justify everything performed by himself.

To furnish some idea of the manner of its application to classical languages, the writer of this pamphlet is enabled to state the particulars of an experiment made by himself upon a pupil, a little boy of only eleven years of age. The experiment was instituted, and is now carrying on, under circumstances by no means favourable to the attainment of a flattering result, and which indeed rendered the thorough adoption of the method of Jacotot inadvisable. Enough, however, has been positively ascertained, to allow of a tolerably accurate conjecture as to the ultimate result. The little pupil in question had been some time employed in committing to memory the Greek grammar, and was about to commence the business of elementary translation in that language, just at the time when the writer of these pages first heard of the New System. It was resolved by him at once to put the pretensions of this method to the test, and to make his pupil proceed according to the instructions of Jacotot. The grammar was therefore temporarily abandoned, and the Iliad of Homer, with an interlinear translation of the first book, was at once put into the pupil's hands. He was told to commit to memory the first five lines, and at the same time to observe attentively, in his translation, the English meaning of every word contained in them. Five additional lines were stipulated for the next day's task, which were repeated, together with the five first learned. He continued to learn daily five or six lines, always commencing the repetition with the beginning of the book, until one hundred were thoroughly impressed on his memory, which brings the experiment to the period of the present statement. Whatever improvement then is at present evident, has been derived from the thorough investigation of this century of Greek verses. At first, the task of committing even five verses to memory, and repeating them without a single error, was thought very difficult by the pupil, and the blundering and hesitancy of the first repetition, certainly repressed a little the sanguine anticipations of his instructor. Perseverance, however, in the practice of always commencing with the first word learned, soon produced a surprising facility of repetition. Within a week, the first thirty verses were so well impressed on the pupil's memory, that he could not only repeat them as quickly as utterance would permit, without the omission of a single word, but whenever the first word of any sentence whatever contained in them was mentioned, he continued that sentence without the slightest hesitation. *But more than this, whatever word was pronounced, even though it were a mere unemphatical conjunction, he could repeat successively every line in which it was to be found,* within the range of his then limited acquaintance with the book.

Before, however, the pupil had arrived at this proficiency of repetition,—as soon, indeed, as the second lesson had been repeated,—he was directed to translate, from the Greek text alone, the ten lines with which he had then become acquainted, by means of the interlinear translation. This being performed without the least difficulty, a series of questions upon the subject itself was commenced by the instructor, of which the following formed a part. The answers are nearly verbatim those given by the pupil himself.*

Q. What is the subject of the Iliad of Homer?

A. The wrath of Achilles.

Q. How do you ascertain that?

A. Because the Muse is called upon by Homer to sing the wrath of Achilles.

Q. Do you know whether the wrath of Achilles produced any mischievous effects?

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* It should be observed, that the very words and phrases of the Greek text were given in the answers of the pupil. It was not thought necessary to intermingle the two languages in the present illustration.

A. Yes; it is called *destructive* wrath, and Homer says it *caused ten thousand woes* to the Achaians.

Q. Has the epithet *destructive* any connection with the fact, that ten thousand woes were occasioned by the wrath of Achilles?

A. Yes; it was called *destructive, because it occasioned*, &c.

Q. What kind of scenery may we expect to be introduced to in the Iliad?

A. Scenes of battle and bloodshed.

Q. Why not pictures of pastoral happiness, or riotous joy?

A. Because these would be inconsistent with *destructive wrath.*

Q. Why inconsistent; could not then these be introduced into the poem?

A. Yes; but there must be more of the others.

Q. What do you infer from the expression,—*And made them preys to the dogs and all birds?*

A. That their bodies were left unburied on the field of battle.

Q. Does it positively state that?

A. No; but if they had been buried, the dogs and birds could not have got at them.*

After about twenty lines had been translated, and examined thoroughly by questions, in order to discover whether his attention had been uniform, the following question was asked:—

Did you perceive in any line that you have translated, a word or words not strictly necessary to the sense?

The prompt answer was—Yes; Homer says, Apollo sent an *evil* pestilence into the camp; the word *evil* is not quite necessary,—it could not be good.

He afterwards said he thought there was another such instance in the eighth verse,—to fight *in strife;* they could not fight, he said, *without strife.*

To ascertain how far he could generalise upon what he knew, he was told to observe the twelfth and nine following verses (which narrate the arrival of Chryses at the camp of the Achaians for the purpose of redeeming his daughter, with his address to the army), and to mention the sentiment or feeling discovered in action. He at once answered, Parental affection. The subjoined colloquy then occurred.

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* As the instructor had resolved to make the pupil find out everything himself, it was not thought advisable to explain that the Greeks were accustomed to *burn* and not to *bury* their dead. He shortly after inferred this himself from the fifty-second line, where it stated, that *funeral pyres were incessantly burning* in the camp of the Achaians, on account of the numbers destroyed by the pestilence. Others passages subsequently met with he *referred* to this, and thus confirmed his conjecture.

Q. Why came Chryses to the Achaian camp?

A. To redeem for himself his daughter.

Q. How did he hope to effect his wishes?

A. By bringing boundless ransoms, and by showing himself to be Apollo's priest.

Q. What did he appeal to in bringing ransoms?

A. Their love of money.

Q. And what in exhibiting the insignia of the priesthood?

A. To their religious reverence.

Q. Can you confirm your assertions?

A. Yes; Chryses, in his address to the army, begs them to liberate his daughter, *reverencing* the son of Jove, far-darting Apollo.

The pupil having been led by two or three simple questions to notice that Chryses, the priest, is twice observed supplicating within the first fifty verses, was told to distinguish between the objects of these two several addresses, and the persons to whom they were made. He answered,—Chryses, in the first instance, addressed Atrides and the Achaian camp,—in the second, King Apollo. The object of his first prayer was, the recovery of his daughter; of the second, vengeance on those who had insulted him.

It was remarked,—The expression of Chryses is,—May the Danaans atone for my tears by thy darts. What have you to say upon this?

A. The Greeks had given him tears, and he asked Apollo to give them darts.

His reasoning faculty was sometimes brought into exercise by the following plan:—Any fact amongst those that he knew, was chosen as a point to set out from, and he was made to show how it stood connected in both the relation of cause and effect, with what preceded and succeeded it. For example, verse 58:

> And rising up, addressed the swift-footed Achilles—

Q. Whom did Achilles address?

A. The people then assembled.

Q. Why were they assembled?

A. Because Achilles had called them together.

Q. Why?

A. Because Juno put it into his mind to do so.

Q. Why?

A. Because she pitied the Danaans.

Q. Why did she pity them?

A. Because she saw them dying.

Q. Why dying?

A. Because Apollo sent a pestilence.

Q. Why?

A. Because he was enraged at his heart.

Q. Why was he enraged?

A. Because Chryses had told him of his wrongs, and prayed for revenge.

Q. Why did Chryses thus pray?

A. Because he had been harshly treated.

Q. Who treated him harshly?

A. Agamemnon; because he did not wish to give up his daughter.

Q. How do you know Agamemnon had her.

A. Because he says expressly,—I will not liberate her until old age comes upon her in our (or my) house in Argos.

Q. Do you know from any single passage what we have thus discovered, namely, that the harsh treatment of Chryses was the cause of the pestilence sent upon the army?

A. Yes; Homer states it beforehand,—the son of Latona and Jove, being enraged with the king, sent a pestilence, &c., because Agamemnon dishonoured Chryses, &c.

He was thus led to perceive the unity of design pervading the work, and to enter into the spirit of every circumstance introduced. But he did more. Not a single word was passed until the idea of which it was the representative was distinctly pictured in his mind, and hence, whenever the word afterwards occurred, both the idea itself (which is evidently independent of language), and the English term which answered to it, were instantaneously suggested. The constant repetition was maintained, and his acquaintance with the English expressions equivalent to those of the Greek was ascertained, by the exercise of giving sometimes the Greek phrase, and requiring instantly the corresponding literal English; sometimes by giving the latter and requiring the former:—thus, the pupil was told to give the Greek for "Sing thou the wrath of Achilles,"—"and prematurely sent many brave souls,"—"and the will of Jove was accomplished," &c. In the first instance, the exact expression was preserved. After a little time, the exercise was varied by slightly changing the sentences, still requiring nothing but what (as his prompt answers invariably showed) he was fully competent to perform, thus—"Sing thou, goddess, the wrath of Pelides' son,"—"and sent brave souls," &c.

After his perfect acquaintance with the corresponding terms and expressions in the two languages was thus ascertained, and he had been interrogated (as previously shown), it was considered that he thoroughly understood the sense of the hundred lines in question, and his attention was sedulously directed to the terminations, prefixes, &c., of all the words, and to the strict analysis of compounds. Whenever a word came under notice which he had before known, but the meaning of which he had forgotten, he was made to refer to the previous sentences in which it was found, discover what must have been its signification there, and give the same meaning in the passage in question. *He was never told a single word,* nor allowed to refer to dictionary or interlinear translation while receiving a lesson. The author was always made to interpret himself.* The present result is easily stated. From the acquaintance he has obtained with the one hundred lines in question, *after not more than twelve hours of lessons,* it is considered (and indeed this has been ascertained by careful examination) that he will scarcely meet with fifty words in the remainder of the first book of the Iliad, of which he will not know something. He will be able to interpret the meaning, the prefix, or the termination. Other experiments, of the same kind, are now making, the results of which will shortly appear.

From the preceding pages, it appears that the advantages of Jacotot's system may be comprehended in the following summary: —*it calls into action the mental faculties of the pupil himself,*—he cannot rely on his teacher, he gains confidence in his own powers, and his improvement is of necessity solid. Hence, *It tends to cultivate in the highest possible degree the faculty of attention. It employs the analytical plan in the place of the synthetical,*—the pupil is not puzzled with abstractions and generalities at the first stage; he is previously led to comprehend the facts upon which they are founded. *It thus conducts from the known to the unknown,*—the pupil makes what he knows serviceable in interpreting what he knows not. *It exercises equally the memory and the judgment,*—everything that the pupil commits to memory he makes thoroughly his own by reflection. And finally, *it ensures the utmost facility of performance by the incessant repetition of every prescribed lesson and exercise.*

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* The following passage from the "Quarterly Review," No. XLIV., serves to enforce the superiority of this method of acquiring languages. "The only method of obtaining an accurate or extensive knowledge of any language is, to study it with as little use of the dictionary as possible, to discover the exact signification and propriety of words by a comparison of different passages, and to interpret authors by themselves."

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